NATURE IN SINGAPORE **15**: e2022145
Date of Publication: 28 December 2022
DOI: 10.26107/NIS-2022-0145

Biodiversity Record: Greenhouse frog, *Eleutherodactylus planirostris*, on Sentosa Island

Jayanthi **Puniamoorthy**[1*], Mohammad Azlin Bin **Sani**[1], Sebastian **Pohl**[1,4], **Ang** Yuchen[2,4] & Eunice Jingmei **Tan**[1,3]

[1]Yale-NUS College, National University of Singapore, Singapore 138527, Republic of Singapore; Email: j.punia@nus.edu.sg ([*]corresponding author)
[2]Lee Kong Chian Natural History Museum, National University of Singapore, Singapore 117377, Republic of Singapore
[3]Department of Biological Sciences, National University of Singapore, Singapore 117543, Republic of Singapore
[4]NUS College, National University of Singapore, Singapore 138593, Republic of Singapore

Recommended citation. Puniamoorthy J, Sani MAB, Pohl S, Ang Y & Tan EJ (2022) Biodiversity Record: Greenhouse frog, *Eleutherodactylus planirostris*, on Sentosa Island. Nature in Singapore, 15: e2022145. DOI: 10.26107/NIS-2022-0145

Subject: Greenhouse frog, *Eleutherodactylus planirostris* (Amphibia: Anura: Eleutherodactylidae).

Subject identified by: Chan Kin Onn.

Location, date and time: Sentosa Island, Mount Serapong (1.24996°N 103.83584°E); 12 July 2022, around 1130 hrs.

Habitat: Secondary forest at an abandoned concrete fort structure.

Observer: Jayanthi Puniamoorthy.

Observation: One individual of about 1.5 cm snout-vent length (Fig. 1) was found alive in a leaf litter sample collected as part of an insect biodiversity survey of Sentosa Island. It was returned to the same location the next day.

Fig. 1. Dorsal view of the subject, ex-situ in a sample cup. (Photograph by: Jayanthi Puniamoorthy).

Remarks: *Eleutherodactylus planirostris*, described by Cope (1862, as *Hylodes planirostris*), was first reported in Singapore in 2016 (Groenewoud & Law, 2016). Since then, this alien species has been recorded in several parts of the main island (Tay et al., 2017; Yeo et al., 2018; GBIF.org, 2022) and is suspected to be widespread (Ong, 2022). *Eleutherodactylus planirostris* was apparently first recorded on Sentosa based on a photograph on iNaturalist (inaturalist.org/observations/120135316) taken on 27 May 2022 by Cristian Lucanas at an unspecified part of the island. The present record appears to be the second of this introduced species for Sentosa Island. There are currently no known records of the greenhouse frog from the other islands of Singapore. This species is easily overlooked due to its small size, cryptic appearance and inconspicuous vocalizations (Olson et al., 2012).

The greenhouse frog is a direct developing (i.e. lacking a free-living tadpole phase) insectivorous amphibian native to Cuba and its surroundings (Ferreira et al., 2015). Although commonly referred to as an invasive species, the impact of the greenhouse frog on native fauna has yet to be assessed in Singapore and other parts of Southeast Asia where it has been introduced. Studies of the species in North America suggest that they appear to feed predominantly on ants in the leaf litter (Olson & Beard, 2012; Ferreira et al., 2015). With the abundance of ants inhabiting the soil surface and leaf litter documented in previous studies (Donoso & Ramón, 2009; Silva & Brandão, 2010; Wang et al., 2022) and our ongoing research, it appears that the greenhouse frog is capable of thriving in the wooded areas of Singapore.

Note: The authors would like to thank the Sentosa Development Corporation for supporting our survey of the insect biodiversity on Sentosa Island, and acknowledge Yale-NUS College IG20-SG103, Ministry of Education AcRF Tier 1 for funding this research. We also thank Chan Kin Onn for providing the species identification.

Literature cited:

Cope ED (1862) On some new and little known American Anura. Proceedings of the Academy of Natural Sciences of Philadelphia, 14: 151–159.

Donoso DA & Ramón G (2009) Composition of a high diversity leaf litter ant community (Hymenoptera: Formicidae) from an Ecuadorian pre-montane rainforest. Annales de la Société Entomologique de France, 45: 487–499.

Ferreira RB, Beard KH, Choi RT & Pitt WC (2015) Diet of the nonnative Greenhouse Frog (*Eleutherodactylus planirostris*) in Maui, Hawaii. Journal of Herpetology, 49: 586–593.

GBIF.org (2022) GBIF Occurrence Download. https://doi.org/10.15468/dl.qqymf8 (Accessed 16 September 2022).

Groenewoud D & Law IS (2016) First record of greenhouse frog in Singapore. Singapore Biodiversity Records, 2016: 59.

Olson CA & Beard KH (2012) Diet of the introduced Greenhouse Frog in Hawaii. Copeia, 2012: 121–129.

Olson CA, Beard KH & Pitt WC (2012) Biology and impacts of Pacific Island invasive species. 8. *Eleutherodactylus planirostris*, the Greenhouse Frog (Anura: Eleutherodactylidae). Pacific Science, 66: 255–270.

Ong L (2022) Biodiversity Record: A greenhouse frog at Fort Canning. Nature in Singapore, 15: e2022050.

Silva RR & Brandão CRF (2010) Morphological patterns and community organization in leaf-litter ant assemblages. Ecological Monographs, 80: 107–124.

Tay A, Ong M & Selveindran P (2017) Greenhouse frogs at Clementi Woods. Singapore Biodiversity Records, 2017: 103–104.

Wang WY, Soh EJY, Yong GWJ, Wong MKL, Guenard B, Economo EP & Yamane S (2022) Remarkable diversity in a little red dot: a comprehensive checklist of known ant species in Singapore (Hymenoptera: Formicidae) with notes on ecology and taxonomy. Asian Myrmecology, 15: 1–152.

Yeo A, Chow L & Law IS (2018) Greenhouse frog at Dairy Farm. Singapore Biodiversity Records, 2018: 1.