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SHORT COMMUNICATION

REDISCOVERY OF THE FRILLED TAIL GECKO *HEMIDACTYLUS PLATYURUS* (SCHNEIDER, 1792) IN SRI LANKA AFTER MORE THAN 160 YEARS

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Rediscovery of the Frilled Tail Gecko *Hemidactylus platyurus* (Schneider, 1792) in Sri Lanka after more than 160 years

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Abstract: Eight species of *Hemidactylus* are currently recognized in Sri Lanka—*frenatus*, *leschenaultii*, *scabriceps*, *parvimaculatus*, *depressus*, *hunae*, *lankae*, and *pieresii*—with the latter four endemic to the island. A ninth species, *Hemidactylus platyurus*, was until now only confirmed from Sri Lanka by two specimens sent to the British Museum of Natural History by E.F. Kelaart in 1855. There was no exact collection locality recorded for these specimens, which are associated simply with the provenance "Ceylon" (now Sri Lanka). The present communication reports the rediscovery of the gecko *H. platyurus* and confirms its occurrence in Sri Lanka.

Keywords: Arboreal, behavior, Ceylon, *Hemidactylus*, Kelaart.

The genus *Hemidactylus* Oken, 1817, with over 140 recognized species, is one of most species-rich genera of the family Gekkonidae (Uetz & Hošek 2016). Although the genus is widely distributed throughout much of both the Old and New World tropics and subtropics, it achieves its greatest species richness in the Horn of Africa and adjacent regions (Kluge 2001; Carranza & Arnold 2006), with its second centre of richness in South Asia (Bauer et al. 2010). Following the resurrection of several taxa from synonymy (Bauer et al. 2010; Batuwita & Pethiyagoda 2012), eight species of *Hemidactylus* are currently recognized in Sri Lanka (de Silva 2006; Somaweera & Somaweera 2009; Batuwita & Pethiyagoda 2012)—*H. frenatus* Schlegel, 1836; *H. leschenaultii* Duméril & Bibron, 1836; *H. scabriceps* (Annandale, 1906); *H. parvimaculatus* Deraniyagala, 1953; *H. depressus* Gray, 1842; *H. hunae* Deraniyagala, 1937; *H. lankae* Deraniyagala, 1953; *H. pieresii* Kelaart, 1853—with the latter four endemic to the island (Amarasinghe et al. 2009; Batuwita & Pethiyagoda 2012).

A ninth species, *Hemidactylus platyurus* (Schneider, 1792), was until now only confirmed from Sri Lanka by two specimens sent to the British Museum of Natural History [now The Natural History Museum, London] (BMNH 56.1.17.3 a-b) (Image 1) by Edward Frederic Kelaart (1819–1860), the first native Sri Lankan zoologist (Pethiyagoda 2007), in 1855 (Somaweera & Somaweera 2009). There was no exact collection locality recorded for these specimens, which are associated simply with the provenance "Ceylon" (now Sri Lanka), but during 1854–1860 Kelaart worked in the Trincomale and Mannar areas in Sri Lanka (Pethiyagoda 2007). Deraniyagala (1932, 1953) doubted the collection

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Image 1. The two previously known specimens of *Hemidactylus platyurus* from Sri Lanka (BMNH 56.1.17.3 a [left] and b [right]) collected by E.F. Kelaart. Photo courtesy of Patrick Campbell, The Natural History Museum, London (scale bar in mm).

locality of these specimens and suggested that they may be not from Sri Lanka, although Smith (1935) included Ceylon in the distributional range of the species. Taylor (1953) and Das & de Silva (2005) both mentioned that no extant Sri Lankan populations were known, but Manamendra-Arachchi (1995) gave its distribution as 'Island-wide', up to 1000m and Somaweera & Somaweera (2009) in their excellent monograph on the lizards of the country remarked that it was a species of anthropogenic habitats and did not include it among their 'doubtful and erroneous records.' Despite these last reports, no scientists after Kelaart have recorded even a single specimen of *H. platyurus* from Sri Lanka (Ferguson 1877; Boulenger 1890; Smith 1935; Taylor 1953; Manamendra-Arachchi 1995; de Silva 1996; Das & de Silva 2005; de Silva 2006; Wickramasinghe & Somaweera 2002, 2008; Somaweera & Somaweera 2009; Batuwita & Pethiyagoda 2012) and no Sri Lankan records are included in global biodiversity databases such as GBIF (gbif.org) or VertNet (vertnet.org). Hence the gecko was listed as threatened by Bambaradeniya (2001) and data deficient in the local red list (IUCN-SL and MOE-SL 2007; MOE-SL 2012). During the past two decades, there has been a renewal of interest in herpetology in Sri Lanka. Many active herpetological field research workers from Sri Lanka have discovered new reptile and amphibian species, rediscovered species that were considered extinct or doubtful and found new locations of rare reptiles and amphibians. The present communication reports the rediscovery of the gecko *Hemidactylus platyurus* (Schneider, 1792) and confirms its occurrence in Sri Lanka.

Sri Lankan *Hemidactylus platyurus*

In the course of other herpetological activities on 16 August 2015 we observed two adult specimens of *Hemidactylus platyurus* (Image 2) at Maspotha (6^{0}47'44.28"N & 79^{0}54'24.61"E) in the Kurunegala District (North Western Province) in the low country intermediate zone of Sri Lanka. This habitat is mainly rocky with an old temple building made of laterite blocks (= Cabock) and a surrounding area with mixed scrub and jungle. The dominant woody plants include *Ficus molis*, *F. religiosa*, *Mangifera indica*, *Schleichera oleosa* and *Tamarindus indica* trees growing up to 15m and yielding about 60% shade. The site lies at an elevation of 60–90 m, receives an average annual rainfall of <1500mm and has a mean annual temperature of ~30^{0}C. We counted a minimum of 22 individuals in the Maspotha population.

Subsequently (23 November 2015), a second location for *Hemidactylus platyurus* was found at Kalmunei (7^{0}24'56.49"N & 81^{0}49'35.40"E) in the Batticaloa District (Eastern Province) in the low country dry zone of Sri Lanka, near the coast. This habitat is mainly anthropogenic with a high density of buildings, with tall house walls made of laterite blocks and wooden ceilings. The surrounding habitat is characterized by woody plants like a *Cassia fistula*, *Albizia saman*, *Citrus aurantium*, *Cocos nucifera*, *Filicium decipiens* and *Mangifera indica* growing up to 10m and yielding about 35% shade. It lies at an elevation of 1–4 m, with an average annual rainfall of <1000mm and a mean annual temperature of ~31^{0}C. We counted a minimum of 17 individuals in the Kalmunei population.

In Sri Lanka *Hemidactylus platyurus* is an arboreal species that is most active at dusk and throughout the night; however, adults and juveniles were also observed on walls during the day. We observed two to five individuals on the same wall actively hunting insects around artificial lights. During two months of captivity, two adult females from Maspotha were offered a variety of insects, of which they took house flies, mosquitoes, small moths, black ants, crickets, small cockroaches and grass hoppers as food. These geckos are wary and run quickly both day and night when threatened, escaping into crevices in the ceiling or other dark places. Males

Image 2. Living specimens of *Hemidactylus platyurus* from Maspotha: (a) dorsal view, (b) ventral view. (scale bar in mm). © Majintha Madawala

vocalize loudly and engage in apparent territorial behavior, attempting to exclude other males. Although hatchings, juveniles and sub adults have been observed, no egg deposition sites were found. In all respects, the Sri Lankan *H. platyurus* appears to exhibit the same ecological and behavioral traits as the species elsewhere (Ulber & Ulber 1991; Bartlett & Bartlett 1999; Anslem de Silva, 2012).

Discussion

Hemidactylus platyurus has a broad distribution across Southeast Asia, including both mainland areas and parts of the Indo-Australian Archipelago (Bauer & Henle 1994; Manthey & Grossmann 1997; Das 2010). It occurs commonly as a house gecko throughout much of its range (Ulber & Ulber 1991). This is consistent with its biology in the two Sri Lankan populations identified here. Given its proclivity for anthropogenic habitats and its conspicuous vocalizations, it seems unlikely that *H. platyurus* has escaped notice for more than a century and a half (although examples of such oversight exist). It seems more likely that both Kelaart's specimens and those observed by us represent localized establishment of the species. Whether there has been either spatial or temporal continuity between Kelaart's population(s) and ours is not known.

Introduced populations in Florida, USA are known to maintain themselves and reproduce in small areas near their sites of introduction but have not effectively spread over a period of several decades (Meshaka & Lewis 1994; Bartlett & Bartlett 1999; Meshaka et al. 2004). Both in Florida and in Sri Lanka, this may be due either to marginal environmental conditions (drier in Sri Lanka and cooler in Florida than in the natural range) or perhaps to biotic interactions. Punzo (2005) has shown that in communities of introduced *Hemidactylus* in Florida, some species displace others, although he did not consider *H. platyurus*. Genetic evaluation of Sri Lankan *H. platyurus* would be useful to determine if they are distinctive or if they represent one or more introductions from Southeast Asia. It would also be valuable to search for other populations around Sri Lanka, particularly in the areas where Kelaart may have collected in the 1850s. Finally, the populations in Maspotha and Kalmunei should be monitored to determine if they are self-sustaining and if, over time, they spread to other areas or, like those in Florida, remain highly localized.

References

Amarasinghe, A.A.T., M.B. Madawala, D.M.S.S. Karunarathna, S.C. Manolis, A. de Silva & R. Sommerlad (2015). Human-crocodile conflict & conservation implications of Saltwater Crocodiles *Crocodylus porosus* (Reptilia: Crocodylia: Crocodylidae) in Sri Lanka. *Journal of Threatened Taxa* 7(5): 7111–7130; http://dx.doi.org/10.11609/JoTT.o4159.7111-30

Bambaradeniya, C.N.B. (2001). Threatened herpetofauna of Sri Lanka, pp. 91–101. In: Bambaradeniya, C.N.B. & V.N. Samarasekara, (eds.). *An Overview of the Threatened Herpetofauna of South Asia*. IUCN

Sri Lanka and Asia Regional Biodiversity Programme, Colombo, Sri Lanka, 118pp.

Bartlett, R.D. & P.P. Bartlett (1999). *A Field Guide to Florida Reptiles and Amphibians*. Gulf Publishing Company, Houston, Texas, 278pp.

Batuwita, S. & R. Pethiyagoda (2012). Rediscovery of the Sri Lankan 'house gecko' *Hemidactylus pieresii* Kelaart (Reptilia: Gekkonidae) with a redescription of *Hemidactylus depressus* Gray. *Zootaxa* 3359: 17–30.

Bauer, A.M. & K. Henle (1994). *Das Tierreich, Teilband 109. Familia Gekkonidae (Reptilia, Sauria). Part 1. Australia and Oceania*. Walter de Gruyter, Berlin, 306pp.

Bauer, A.M., T.R. Jackman, E. Greenbaum, V.B. Giri & A. de Silva (2010). South Asia supports a major endemic radiation of *Hemidactylus* geckos. *Molecular Phylogenetics and Evolution* 57(1): 343–352; http://dx.doi.org/10.1016/j.ympev.2010.06.014

Boulenger, G.A. (1890). *The Fauna of British India including Ceylon and Burma*. Reptilia and Batrachia. Taylor and Francis, London, 541pp.

Carranza, S. & E.N. Arnold (2006). Systematics, biogeography, and evolution of *Hemidactylus* geckos (Reptilia:Gekkonidae) elucidated using mitochondrial DNA sequences. *Molecular Phylogenetics and Evolution* 38(2): 531–545; http://dx.doi.org/10.1016/j.ympev.2005.07.012

Das, I. (2010). *A Field Guide to the Reptiles of South-East Asia*. New Holland Publishers (UK) Ltd., London, 376pp.

Das, I. & A. de Silva (2005). *A Photographic Guide to Snakes and Other Reptiles of Sri Lanka*. New Holland Publishers (UK) Ltd, London, 144pp.

Deraniyagala, P.E.P. (1932). The Gekkonoideae of Ceylon. *Spolia Zeylanica* 16(3): 291–310.

Deraniyagala, P.E.P. (1953). *A Colored Atlas of Some Vertebrates from Ceylon, Tetrapod Reptilia. Vol. 02*. National Museums of Sri Lanka, Colombo, 101pp.

de Silva, A. (1996). *The Herpetofauna of Sri Lanka: A Brief Review*. Published by author, Kandy, Sri Lanka, 99pp.

de Silva, A. (2006). Current status of the Reptiles of Sri Lanka, pp. 134–163. In: Bambaradeniya, C.N.B. (ed.). *Fauna of Sri Lanka: Status of Taxonomy, Research and Conservation*. IUCN Sri Lanka, Colombo, 308pp.

Ferguson, W. (1877). *Reptile Fauna of Ceylon: Letter on a collection sent to the Colombo Museum*. Government printers, Ceylon (Sri Lanka), 42pp.

IUCN-SL and MOE-SL (2007). *The 2007 Red List of Threatened Fauna & Flora of Sri Lanka*. Colombo, Sri Lanka, 148pp.

Kluge, A.G. (2001). Gekkotan Lizard Taxonomy. *Hamadryad* 26(1): 1–209.

Manamendra-Arachchi, K. (1995). The geckos of Sri Lanka. *Lyriocephalus* 2(1&2): 82.

Manthey, U. & W. Grossmann (1997). *Amphibien und Reptilien Südostasiens*. Natur und Tier - Verlag, Münster, 512pp.

Meshaka, Jr. W.E. & J. Lewis (1994). *Cosymbotus platyurus* in Florida: ten years of stasis. *Herpetological Review* 25(3): 127.

Meshaka, Jr. W.E., B.P. Butterfield & J.B. Hauge (2004). *The Exotic Amphibians and Reptiles of Florida*. Krieger, Melbourne, Florida, 166pp.

MOE-SL (2012). *The National Red List 2012 of Sri Lanka; Conservation Status of the Fauna and Flora*. Ministry of Environment, Colombo, Sri Lanka, 476pp.

Pethiyagoda, R. (2007). *Pearls, Spices and Green Gold: An Illustrated History of Biodiversity Exploration in Sri Lanka*. Wildlife Heritage Trust Ltd. Publications, Colombo, Sri Lanka, 241pp.

Punzo, F. (2005). The introduction of hemidactyline geckos in Florida: Colonization and impact on native fauna, pp. 231–237. In: Meshaka, W.E. & K.J. Babbitt (eds.). *Amphibians and Reptiles, Status and Conservation in Florida*. Krieger Publishing Co., Malabar, Florida, 334pp.

Smith, M.A. (1935). *The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia*. Taylor and Francis, London, 440pp.

Somaweera, R. & N. Somaweera (2009). *Lizards of Sri Lanka, a Colour Guide with Field Keys*. Chimaira, Frankfurt am Main, 304pp.

Taylor, E.H. (1953). A review of the lizards of Ceylon. *The University of Kansas Science Bulletin* 35(2): 1525–1585.

Uetz, P. & J. Hošek (2016). The Reptile Database. http://www.reptile-database.org (accessed 09.06.16).

Ulber, T. & E. Ulber (1991). *Cosymbotus platyurus* (Schneider). *Sauria Supplement* 13(1–4): 201–204.

Wickramasinghe, M. & R. Somaweera (2002). Distribution and current status of the endemic geckos of Sri Lanka. *Gekko* 3(1): 2–13.

Wickramasinghe, M. & R. Somaweera (2008). Changes in the distribution ranges of the Sri Lankan *Hemidactylus* geckos. *Gekko* 5(2): 44–60.

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