

Phylogenetic Relationships and Biogeographic Origins of Sri Lankan Sun Skinks (Reptilia: Scincidae: *Eutropis*)

P.L.T. Nirath^{1*}, A. de Silva² and K.D.B. Ukuwela¹

¹*Department of Biological Sciences, Faculty of Applied Sciences, Rajarata University, Mihinthale 50300, Sri Lanka*

²*Amphibia and Reptile Research Organization of Sri Lanka, 15/1, Dolosbage Road, Gampola 20500, Sri Lanka*

**niraththilini@gmail.com*

Sun skinks (*Eutropis*) are a diverse group of lizards (46 species) distributed in India, Southeast Asia, mainland Asia and the Philippines. Among the ~130 species of lizards in Sri Lanka, *Eutropis* are the second most diverse group of skinks in Sri Lanka which raise intriguing questions regarding their origins in Sri Lanka. Therefore, in this study phylogenetic affinities and biogeographic origins of Sri Lankan *Eutropis* were examined by placing 6 of the 9 Sri Lankan taxa with a dataset generated for 20 *Eutropis* species in previous studies. Field sampling was carried out in 15 selected locations in the country and sun skinks (3-5 individuals per species) were hand-captured and tail-tissue samples were collected upon identification. Mitochondrial protein-coding, *NADH dehydrogenase subunit 2* (*ND2*) and the nuclear protein-coding *Melanocortin receptor 1* (*MC1R*) genes were PCR amplified and sequenced upon DNA extraction from the tissues to evaluate phylogenetic relationships. Maximum Likelihood and Bayesian methods were used to evaluate phylogenetic relationships and species divergence times were estimated using a fossil-calibrated Bayesian framework. Representative species from Scincine, Lygosomine, Sphenomorphine and Xantusid lineages were used as outgroup taxa. Biogeographic origins of Sri Lankan *Eutropis* were evaluated through ancestral area reconstructions. Phylogenetic analyses indicated that all Sri Lankan taxa were closely related to Indian taxa. The findings further revealed that the majority of the Sri Lankan *Eutropis* (e.g. *Eutropis tammanna*) originated from colonization events from India in the Miocene era [20-12 million years ago (mya)]. However, certain species colonized Sri Lanka from India (e.g. *E. bibronii* and *E. beddomei*) recently in the Pleistocene era (1.98-0.57 mya). Some of these dispersal events triggered *in-situ* speciation events within the island. Thus, the findings indicate that both multiple colonization events from India and diversification within Sri Lanka have been responsible for generating the present diversity of *Eutropis* in Sri Lanka.

Keywords: Ancestral area reconstruction, Biodiversity hotspot, Dispersal, Colonization, *in-situ* diversification