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Taxonomic revision of the semi-aquatic skink *Parvoscincus leucospilos* (Reptilia: Squamata: Scincidae), with description of three new species

CAMERON D. SILER¹, CHARLES W. LINKEM², KERRY COBB³, JESSA L. WATTERS¹, SEAN T. CUMMINGS¹, ARVIN C. DIESMOS⁴ & RAFE M. BROWN³

¹Department of Biology and Sam Noble Oklahoma Museum of Natural History; University of Oklahoma, 2401 Chautaugua Ave., Norman, OK 73072-7029, USA. E-mails: camsiler@ou.edu, jwatters@ou.edu, sean.t.cummings-1@ou.edu

²Department of Biology; University of Washington, Seattle, WA 98195-1800, USA. Email: cwlinkem@gmail.com

³Biodiversity Institute and Department of Ecology and Evolutionary Biology; University of Kansas, 1345 Jayhawk Blvd, Lawrence, KS 66045-7593, USA. E-mails: cobbkerry@gmail.com, rafe@ku.edu

⁴Herpetology Section, Zoology Division, Philippine National Museum, Rizal Park, Burgos St., Manila, Philippines. E-mail: arvin.diesmos@gmail.com

Abstract

We review the recent discovery of multiple populations of the enigmatic, semi-aquatic *Sphenomorphus* Group skink, *Parvoscincus leucospilos* Peters, and investigate the morphological and genetic diversity of isolated, allopatric populations of this unique skink. Our investigations support the recognition of four unique evolutionary lineages distributed across Luzon Island in the Philippines, three of which are herein described as new species (*P. tikbalangi* sp. nov., *P. manananggalae* sp. nov., and *P. duwendorum* sp. nov.). All four recognized species are genetically divergent in both mitochondrial and nuclear DNA sequences, and morphologically distinct. The description of three new Luzon Island endemic species adds to the growing body of literature suggesting that mechanisms driving the accumulation of vertebrate diversity in the Philippines may vary regionally across the archipelago.

Key words: biodiversity, conservation, cryptic diversity, endemism, lizard, Luzon Island, riparian, Southeast Asia, *Sphenomorphus* group

Introduction

Recent studies have revealed that our understanding of amphibian and reptile diversity in the Philippines is vastly underestimated (Brown *et al.*, 2013a). Phylogeny-based studies focused on species delimitation have identified and revised numerous species complexes within the Philippines (Brown and Guttman, 2002; Brown *et al.*, 2009, 2010; Siler *et al.*, 2010a,b, 2011a,b, 2012; Siler and Brown, 2010; Welton *et al.*, 2009, 2010a,b; Linkem *et al.*, 2010a,b; Linkem and Brown, 2013); many of these complexes were once considered by taxonomists to be widely distributed species (e.g., Leviton, 1963; Brown and Alcala, 1970, 1980). More recent studies, fueled with evidence documenting high levels of genetic divergence between isolated evolutionary lineages repeatedly have found that few endemic Philippine reptiles actually possess broad distributions spanning regionally recognized faunistic boundaries (Brown and Diesmos, 2009; Brown *et al.*, 2013a; Linkem and Brown, 2013). Although molecular data have had a tremendous impact on the discovery and identification of unique biodiversity in the archipelago, extensive survey work has resulted in the rediscovery of several enigmatic reptile species (*Eutropis bontocensis* Taylor [Barley *et al.*, 2013], *Brachymeles elerae* Taylor [Siler, 2010], *B. pathfinderi* Taylor [Siler *et al.*, 2011c], *Hologerrhum philippinum* Günther (McLeod *et al.*, 2011; Brown *et al.*, 2013b), *Platymantis polillensis* Taylor and *P. cornutus* Taylor (Siler *et al.*, 2011c; Brown *et al.*, 2012, 2013b). These rediscoveries have resulted in a better understanding of the ecology and distribution of these putatively rare species, and in many cases, revealed that they are not in fact rare, simply misunderstood or with previously unappreciated microhabitat preferences. The rediscovery and phylogenetic assessment of the Philippine endemic, semi-aquatic skink *Parvoscincus leucospilos* Peters, 1872 (Brown *et al.*, 2000, 2013; Linkem *et al.*, 2011; McLeod *et al.*, 2011; Siler *et al.*, 2011d) is exactly one such situation.

still vastly underestimate reptile diversity in this geographically dynamic island nation. Not only will future studies undoubtedly discover and describe additional species of skinks, but, as we approach a more accurate understanding of the country's taxonomic diversity for various species groups, researchers will be able to begin questioning broad-scale mechanisms of diversification (Brown *et al.*, 2013a). For example, what are the mechanisms driving the disparate accumulation of biodiversity in different regions of the archipelago? Considering scincid lizards alone, why does the Luzon faunal region possess by far the highest species richness in the archipelago (Linkem and Brown, 2013; Davis *et al.*, in press)? Studies focused on the mechanisms driving the assembly and evolution of vertebrate communities are poignant topics for future investigation (Brown *et al.*, 2013a).

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