

Molecular evidence for the taxonomic status of *Hemidactylus brookii* group taxa (Squamata: Gekkonidae)

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Hemidactylus brookii has one of the widest distributions and, arguably, one of the most confused taxonomic histories of any gekkonid lizard. Nuclear (RAG1 and PDC) and mitochondrial (ND2, *cytb*) DNA sequence data were employed to examine relationships among a sample of putative *H. brookii*, including a topotypical specimen from Borneo. Two clades were recovered, one consisting of specimens from Borneo (Sarawak), Myanmar, Peninsular Malaysia and Karnataka, southwestern India, and another of specimens from Sri Lanka, Mauritius and Kerala, southwestern India. Both clades are well supported and deeply divergent from one another, whereas genetic variation within each clade is limited. None of the analytical approaches used recovered a well-supported monophyletic *H. brookii sensu lato*. Near uniformity of *H. brookii sensu stricto* in East Asia suggests that this species has spread to this region relatively recently. The name *H. parvimaclatus* Deraniyagala 1953 is available for the Sri Lankan clade and this form should be treated as a valid species. Existing data cannot be used to distinguish whether this species has colonized Sri Lanka from South India or vice versa. The Palghat Gap provides a candidate barrier to gene flow between *H. brookii* and *H. parvimaclatus*. Although the identity of *H. brookii* complex geckos in East Asia and Sri Lanka appears resolved, the situation in India and Pakistan remains complex and thorough revisionary work, coupled with phylogenetic studies, is needed to determine species boundaries in this region.

Key words: *H. parvimaclatus*, India, Sri Lanka, phylogeny, taxonomy

INTRODUCTION

The systematic status of *Hemidactylus brookii* has long been confused. For most of the last 100 years it has been considered a polytypic species with a nearly pan-tropical distribution (Smith, 1935; Loveridge, 1947; Wermuth, 1965; Kluge, 1969; Rösler, 2000). Kluge (1969) argued on morphological grounds that the New World “brookii”, *H. b. haitianus* and *H. b. leightoni*, formed with *H. palaichthus* a natural radiation in the Americas. He also resurrected the use of *H. brookii angulatus* for the African members of the group, which had been considered subspecifically identical with those of tropical Asia. However, he did not comment specifically on the Asian forms themselves, the group to which the name *brookii* is, in fact, linked. Carranza & Arnold (2006), in a molecular phylogeny of *Hemidactylus*, demonstrated that *H. b. haitianus* (elevated to full specific status along with *H. leightoni* by Powell et al., 1996) and *H. b. angulatus* were members of an African clade, distinct from Asian *H. brookii*, and that at least *H. palaichthus* belonged to yet another major clade within the genus. Thus, of the non-Asian subspecies of *H. brookii* recognized by Kluge (1969), *H. leightoni* is a valid species restricted to northern South America (Rivas, 2002), *H. angulatus* is probably a

complex of species, all restricted to Africa (Carranza & Arnold, 2006) and *H. haitianus* is a valid species of the *angulatus* group, occurring both in West Africa and in the West Indies, where it was probably introduced within historical times (Weiss & Hedges, 2007).

At present at least eight names are in the synonymy of Asian *H. brookii* (Brown & Alcalá, 1978; Zug et al., 2007): *Gecko tytleri* Tytler 1865, *H. kushmorensis* Murray 1884, *H. gleadowii* Murray 1884, *H. murrayi* Gleadow 1887, *H. tenkatei* Lidth de Jeude 1895, *H. subtriedroides* Anandale 1905, *H. luzonensis* Taylor 1915, and *H. brookii parvimaclatus* Deraniyagala 1953. Recently Zug et al. (2007) have suggested that an eighth nomen, *H. mahendrai* Shukla 1983, previously regarded as a valid Indian species, may also be based on *H. brookii*.

The majority of these names have long been consigned to synonymy, although Kästle (2002) recognized *H. b. subtriedroides* as a valid species in northern Myanmar and adjacent northeast India, and *H. b. parvimaclatus* has been regarded as valid by most Sri Lankan authors (e.g. Deraniyagala, 1953; Manamendra-Arachchi, 1997; de Silva, 1998; Wickramasinghe & Somaweera, 2002, 2008; Somaweera, 2005; Ziesmann et al., 2007). The extent of the range of “*H. brookii*” remains uncertain and ostensibly extends from Pakistan (Khan et al., 1999;