
Thesis Abstract

Geckos of the genus *Hemidactylus* Oken, 1817 are one of the most widely distributed and species-rich groups of gekkonids. With approximately 90 species, the genus *Hemidactylus* accounts for 10% of the total number of species in the family Gekkonidae (Carranza and Arnold, 2006). They are found in a range of ecological conditions from wet tropical forest to arid deserts. Their wide distribution is believed to have been facilitated not only naturally, but also through human mediated transport. Indian subcontinent houses 31 species of these geckos, 23 of which are endemic to the subcontinent.

The aim of this study was to understand the phylogeny and biogeography of *Hemidactylus* geckos of the Indian subcontinent. In order to arrive at the conclusions regarding the biogeographic history of this widely distributed taxon on the Indian subcontinent, an integrative approach was followed. First the phylogenetic reconstruction of Indian species was undertaken. The ancestral areas of distribution were reconstructed on the phylogeny and the divergence dates of the species were also estimated. Finally, the biogeographic events were inferred in accordance with the geological events with respect to the divergent times for these radiations.

Results indicated that *Hemidactylus* geckos of the Indian subcontinent belong to three geographical clades: Southeast Asian clade, West-Asian arid clade and a 'unique Indian radiation' which consisted majority of the species distributed in India that are largely confined to the Indian subcontinent. Additionally, the three widely distributed, commensal species (*H. brookii*, *H. frenatus* and *H. flaviviridis*) were nested within the Indian radiation suggesting their Indian origin. It was also seen that the endemic *Hemidactylus* geckos of Sri Lanka have been derived from India through multiple independent dispersal events spread across the Oligocene-Miocene. These dispersals were both geo dispersal as well as transmarine dispersal events. However, the species distributed both in India and Sri Lanka appear to have undergone recent dispersals into Sri Lanka and probably back into India, primarily through human agency.

Thus, it was inferred that the Indian subcontinent has served as an important arena for diversification among the *Hemidactylus* geckos and their spread.

In addition, it was discovered that *H. anamallensis*, a species endemic to Southern Western Ghats of peninsular India was probably genetically distinct from *Hemidactylus*, indicating that it could not be *Hemidactylus* at all. Thus, the phylogenetic position of *H. anamallensis* within the subfamily Gekkoninae was also investigated and its genetic distinctiveness from that of *Hemidactylus* was also tested. Results showed that *H. anamallensis* lineage was indeed distinct from *Hemidactylus* group, as well as from other closely related genera (*Cyrtodactylus* and *Geckoella*) in both nuclear and mitochondrial markers. Divergence estimates supported a scenario wherein *H. anamallensis* dispersed across marine barrier to the drifting peninsular Indian plate in the late Cretaceous, whereas *Hemidactylus* arrived on the peninsular India after the Indian plate collided with the Eurasian plate. Based on these molecular evidence and biogeographical scenario it was proposed that genus *Dravidogecko* should be resurrected.