



An addition to the endemic Indian radiation of *Eutropis*: Phylogenetic position of *Eutropis dissimilis* Hallowell (Squamata: Scincidae)

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Abstract. Skinks of the genus *Eutropis* represent one of the most widespread and speciose lizard groups in tropical Asia. Numerous recent studies have utilized a variety of genes and methods to reconstruct the phylogeny of these lizards, however these studies have not resolved the placement of one of the widely distributed *Eutropis* Fitzinger, *E. dissimilis*. We have sequenced a specimen of *E. dissimilis* from the type locality and our result suggests that it is part of the Indian radiation of *Eutropis* and not related to African *Trachylepis* Fitzinger or Southeast Asian *Dasia* Gray as previously suggested. Furthermore, we report that the sequence of *E. dissimilis* used in an earlier study of the once cosmopolitan genus ‘*Mabuya*’ may have been erroneously identified and appears to be a sequence of *E. novemcarinata*. We also demonstrate that the evolution of a clear lower eyelid, which was considered a synapomorphy for the sister genus *Trachylepis*, has arisen multiple times in *Eutropis*.

Key words: *Eutropis*, Indian radiation, Scincidae, systematics

Introduction

Skinks of the genus *Eutropis* represent a seemingly monophyletic clade split out from the genus *Mabuya* Fitzinger which possesses a circumtropical distribution (Mausfeld & Schmitz 2003). The genus *Eutropis* is one of the most speciose genera of the family Scincidae in tropical Asia with over 31 species. Recent molecular phylogenetic studies (Datta-Roy *et al.* 2012; Barley *et al.* 2014) found strong support for two clades within the Asian *Eutropis* radiation: one largely confined to India and the other in the Philippines (see Figure 4 in Barley *et al.* 2014). Relationships among the remaining Southeast Asian species have been more difficult to resolve, and some of the deeper nodes in the phylogeny require further investigation (Barley *et al.* 2014).

The phylogenetic position of *E. dissimilis* (one of the most widely distributed species of *Eutropis*) has remained particularly enigmatic (Mausfeld & Schmitz 2003; Bauer *et al.* 2008; Datta-Roy *et al.* 2012). The distribution of *E. dissimilis* ranges from Afghanistan in the west (Clarke *et al.* 1969) and continues throughout northern India including the Nepal Terai (Sleich & Kastle 2002), while the southernmost population is known from Madhya Pradesh state (Murthy 1990). The eastern limits of its range remain poorly understood, although it has been reported from Bengal (Smith 1935; Tikader & Sharma 1992), Bangladesh (Husain 1974; Khan 1982), Arunachal Pradesh, Assam (Bauer *et al.* 2008), and Myanmar (Zug *et al.* 1998). Thus, it appears that the Brahmaputra River, a major biogeographic boundary in Northeast India (Vidya *et al.* 2005; Pawar *et al.* 2006; Veron *et al.* 2006) has not restricted the dispersal of *E. dissimilis*.

Eutropis dissimilis possesses a transparent window in the lower eyelid rather than a scaly eyelid which is present in most other *Eutropis* (Broadley 2000; Mausfeld & Schmitz 2003; Datta-Roy *et al.* 2012). On the other hand, all species of *Trachylepis* (the Afro-Malagasy clade) possess a transparent window in the lower eyelid (Broadley 2000; Mausfeld & Schmitz 2003). In a phylogenetic study of *Eutropis* by Mausfeld & Schmitz (2003), *E. dissimilis* collected from Myanmar was sister to the arboreal genus *Dasia* Gray (albeit with low node support) rather than to *Eutropis*. Although the clade consisting of *E. dissimilis* and *Dasia* was sister to the *Eutropis* clade, Mausfeld & Schmitz (2003) placed *E. dissimilis* in the genus ‘*Euprepis*’ (now *Trachylepis*). They further mentioned that the transparent lower eyelid in