



Deciphering the cryptic species diversity of dull-coloured day geckos *Phelsuma* (Squamata: Gekkonidae) from Madagascar, with description of a new species

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Abstract

We describe a new *Phelsuma* species from the relictual forest of Anja Reserve (13 km south from Ambalavao, on the central high plateau of southern Madagascar). *Phelsuma gouldi* sp. nov. seems to be an arboreal and possibly rock-dwelling species that has been observed in the private Anja Reserve (949 m a.s.l.), and possibly near Betroka almost 160 km further south-west. The species belongs to the *P. mutabilis* species group and differs from the other three species of the group, *P. mutabilis*, *P. breviceps*, and *P. borai* by a high genetic divergence of more than 10% in the mitochondrial 16S rRNA gene, and by a combination of 7–9 subdigital lamellae under the fourth toe, 6–7 supralabials, one internasal, and numerous details of throat scalation. *Phelsuma mutabilis* comprises three mitochondrial clades with divergences of more than 4% in the 16S rRNA gene, but the lack of distinct morphological differences and absence of a geographical structure among these clades indicate that this pattern is currently best considered as reflecting intraspecific variability.

Key words: Squamata, Gekkonidae, *Phelsuma*, new species, Madagascar, Ambalavao

Introduction

Undescribed cryptic species diversity is widespread in different Malagasy vertebrate groups as shown for example in lemurs (Yoder *et al.* 2000), amphibians (Vieites *et al.* 2009), and chameleons (Townsend *et al.* 2009), and it occurs both in poorly explored and in better studied areas. The accumulation of molecular data sets and the increasing use of integrative taxonomic approaches that combine molecular genetics and comparative morphology allow for a proper delimitation of cryptic but genetically distinct species, as well as for the identification of species complexes hidden under a single scientific name (Vences & Wake 2007; Vieites *et al.* 2009; Padiál *et al.* 2010; Miralles *et al.* 2011). Completing the species inventory of Madagascar's highly endemic fauna is a relevant prerequisite for conservation assessments and thus needs to be accelerated in view of the ongoing habitat destruction on the island. With currently 42 recognised species and subspecies, the genus *Phelsuma* Gray represents the most diverse lizard genus of Madagascar. The genus *Phelsuma* probably originated in Madagascar and subsequently dispersed and radiated in the other Indian Ocean archipelagos, with a different colonisation history on each island group (Austin *et al.* 2004; Harmon *et al.* 2008; Rocha *et al.* 2009, 2010). *Phelsuma* are mostly colourful diurnal geckos of great morphological homogeneity. The colouration ranges from bright green, often with red spots and markings in most species, to dull grey or brownish in a few others. Despite extensive works recently published on *Phelsuma* systematics (e.g. Rocha *et al.* 2009, 2010) and the discovery of three new species within the last two years (Berghof &