



Revision of the giant geckos of New Caledonia (Reptilia: Diplodactylidae: *Rhacodactylus*)

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Abstract

We employed a molecular phylogenetic approach using the mitochondrial ND2 gene and five associated tRNAs (tryptophan, alanine, asparagine, cysteine, tyrosine) and the nuclear RAG1 gene to investigate relationships within the diplodactylid geckos of New Caledonia and particularly among the giant geckos, *Rhacodactylus*, a charismatic group of lizards that are extremely popular among herpetoculturalists. The current generic allocation of species within New Caledonian diplodactylids does not adequately reflect their phylogenetic relationships. *Bavayia madjo*, a high-elevation endemic is not closely related to other *Bavayia* or to members of any other genus and is placed in a new genus, *Paniegekko* **gen. nov.** *Rhacodactylus* is not monophyletic. The small-bodied and highly autapomorphic genus *Eurydactylodes* is embedded within *Rhacodactylus* as sister to *R. chahoua*. *Rhacodactylus ciliatus* and *R. sarasinorum* are sister taxa but are not part of the same clade as other giant geckos and the generic name *Correlophus* Guichenot is resurrected for them. Remaining New Caledonian giant geckos (*R. leachianus*, *R. trachrhynchus*, *R. auriculatus*) receive weak support as a monophyletic group. Although the monophyly of *Rhacodactylus* (including *Eurydactylodes*) exclusive of *Correlophus* cannot be rejected, our results support the recognition of a *R. chahoua* + *Eurydactylodes* clade separate from *Rhacodactylus sensu stricto*. Because of the distinctiveness of *Eurydactylodes* from *R. chahoua* (and other New Caledonian ‘giant geckos’), we retain this name for the four species to which it has been consistently applied and erect a new genus, *Mniarogekko* **gen. nov.** to accommodate *R. chahoua*. There is little genetic differentiation within the narrowly distributed *Correlophus sarasinorum*, but *C. ciliatus* from southern New Caledonia are both genetically and morphologically differentiated from a recently discovered *Correlophus* from the Îles Belep, north of the Grande Terre, which is here described as *C. belepensis* **sp. nov.** Although only subtly different morphologically, the populations of *Mniarogekko* from the far northwest of the Grande Terre and from the Îles Belep are strongly differentiated genetically from *M. chahoua* populations in the central part of the Grande Terre and are described as *M. jalu* **sp. nov.** *Rhacodactylus auriculatus* exhibits some genetic substructure across its nearly island-wide range in New Caledonia, but overall divergence is minimal. *Rhacodactylus leachianus* exhibits low levels of divergence across its range and southern insular forms previously assigned to *R. l. henkeli* are not divergent from southern Grande Terre populations. The few populations of *R. trachrhynchus* sampled are strongly divergent from one another and a specimen from Îlot Môrô near the Île des Pins is especially distinctive. This specimen and others examined from Îlot Môrô are morphologically assignable to the species described by Boulenger in 1878 as *Chameleonurus trachycephalus* and is recognized here as a full species. New diagnoses are provided for each of the eight genera of endemic New Caledonian diplodactylid geckos now recognized. The results of our study necessitate determinations of the conservation status of the new species described or recognized. *Mniarogekko jalu* **sp. nov.** is considered Endangered, but is locally abundant. *Correlophus belepensis* **sp. nov.** is considered Critically Endangered and is restricted to the ultramafic plateaux of Île Art. Although described from the Île des Pins, we have only been able to confirm the existence of *Rhacodactylus trachycephalus* on the tiny satellite island Îlot Môrô and consider it to be Critically Endangered. If indeed restricted to this islet, *R. trachycephalus* may well have the smallest range and perhaps the smallest population of any gecko in the world.

Key words: Squamata, *Rhacodactylus*, *Correlophus*, *Mniarogekko* **gen. nov.**, *Paniegekko* **gen. nov.**, *Correlophus belepensis* **sp. nov.**, *Mniarogekko jalu* **sp. nov.**, New Caledonia, molecular phylogenetics, conservation