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A cryptic new species of *Miniopterus* from south-eastern Africa based on molecular and morphological characters

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Abstract

Resolving species limits within the genus *Miniopterus* has traditionally been complicated by the presence of cryptic species with overlapping morphological features. We use molecular techniques, cranio-dental characters and tragus shape to describe a new species of *Miniopterus* from Mozambique, *M. mossambicus*. *Miniopterus mossambicus* shows > 12% divergence in cytochrome-b sequence from its nearest congeners (the Malagasy *M. gleni* and *M. griveaudi*) and > 15% divergence from the morphologically similar *M. natalensis*, *M. fraterculus* and *M. minor* (all of which occur in southern and eastern Africa). There is considerable overlap in cranio-dental characters of the southern African species, particularly *M. natalensis* and *M. mossambicus*. However, tragus shape and multivariate comparisons of skull measurements can be used to separate these species. Based on morphological comparisons of museum specimens, this species may also be present in neighbouring Malawi and Zimbabwe, suggesting that it is probably distributed widely in south-central Africa.

Key words: taxonomy, morphometrics, molecular genetics, *Miniopterus*, Mozambique

Résumé

Résoudre les délimitations des espèces au sein du genre *Miniopterus* a toujours été compliqué à cause de la présence d'espèces cryptiques dont les caractéristiques morphologiques se chevauchent. Nous utilisons des techniques moléculaires, des caractères cranio-dentaires et la forme des tragus pour décrire une nouvelle espèce de *Miniopterus* venant du Mozambique, *M. mossambicus*. Les séquences de cytochrome-b de *M. mossambicus* montrent une divergence supérieure à 13% par rapport à ses plus proches congénères (les formes malgache *M. gleni* et *M. griveaudi*), et une divergence supérieure à 15% par rapport à *M. natalensis*, *M. minor* et *M. fraterculus* qui lui sont morphologiquement semblables (ces dernières sont distribuées dans le sud et l'est de l'Afrique). Il y a un chevauchement considérable des caractères cranio-dentaires des espèces du sud du continent africain, en particulier *M. natalensis* et *M. mossambicus*. Cependant, la forme du tragus et les comparaisons multivariées des mesures crâniennes peuvent être utilisées pour séparer ces espèces. Sur la base de la comparaison morphologique des spécimens muséologiques, cette espèce pourrait également être présente dans les pays voisins du Malawi et du Zimbabwe, ce qui suggère qu'elle est probablement largement distribuée en Afrique sud-centrale.

Introduction

In the past decade, numerous species of bats new to science have been described from sub-Saharan Africa (Fahr *et al.* 2002; Stanley 2008; Taylor *et al*. 2012; Monadjem *et al*. 2013), underscoring the ever increasing chiropteran

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With the description of a new species from south-eastern Africa herein, some advances are being made in the regional systematics of this genus. However, portions of tropical central and western Africa remained to be studied based on specimens with associated tissues. As has been demonstrated for Malagasy *Miniopterus* (Goodman *et al.* 2007), a critical step in resolving species limits and attaching binomial names to different clades is the sequencing of type or topotypic specimens. This will be a key step in resolving the systematics of sub-Saharan *Miniopterus.*

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