

# ZOOTAXA

2103

**Review of the systematics, morphology and distribution of Malagasy dwarf geckos, genera *Lygodactylus* and *Microscalabotes* (Squamata: Gekkonidae)**

MARTA PUENTE, FRANK GLAW, DAVID R. VIEITES & MIGUEL VENCES



Magnolia Press

MARTA PUENTE, FRANK GLAW, DAVID R. VIEITES & MIGUEL VENCES  
**Review of the systematics, morphology and distribution of Malagasy dwarf geckos, genera *Lygodactylus*  
and *Microscalabotes* (Squamata: Gekkonidae)**  
(*Zootaxa* 2103)

76 pp.; 30 cm.

11 May 2009

ISBN 978-1-86977-365-6 (paperback)

ISBN 978-1-86977-366-3 (Online edition)

FIRST PUBLISHED IN 2009 BY

Magnolia Press

P.O. Box 41-383

Auckland 1346

New Zealand

e-mail: [zootaxa@mapress.com](mailto:zootaxa@mapress.com)

<http://www.mapress.com/zootaxa/>

© 2009 Magnolia Press

All rights reserved.

No part of this publication may be reproduced, stored, transmitted or disseminated, in any form, or by any means, without prior written permission from the publisher, to whom all requests to reproduce copyright material should be directed in writing.

This authorization does not extend to any other kind of copying, by any means, in any form, and for any purpose other than private research use.

ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)



## Review of the systematics, morphology and distribution of Malagasy dwarf geckos, genera *Lygodactylus* and *Microscalabotes* (Squamata: Gekkonidae)

MARTA PUENTE<sup>1</sup>, FRANK GLAW<sup>2</sup>, DAVID R. VIEITES<sup>3</sup> & MIGUEL VENCES<sup>4\*</sup>

<sup>1</sup>Laboratorio de Anatomía Animal, Facultad de Ciencias, Universidade de Vigo, E-36200 Vigo, Spain; martapuenta@gmail.com

<sup>2</sup>Zoologische Staatssammlung München, Münchhausenstr. 21, 81247 München, Germany

<sup>3</sup>Museo Nacional de Ciencias Naturales—Consejo Superior de Investigaciones Científicas (CSIC). C/ José Gutiérrez Abascal n°2, 28006, Madrid, Spain.

<sup>4</sup>Technical University of Braunschweig, Zoological Institute, Spielmannstr. 8, 38106 Braunschweig, Germany

\* Corresponding author; m.vences@tu-bs.de

### Table of contents

Abstract .....	4
Introduction .....	4
Material and Methods .....	5
Specimens examined .....	5
Morphological and morphometric characters .....	6
Results .....	11
<i>Lygodactylus madagascariensis</i> group .....	11
<i>Lygodactylus expectatus</i> Pasteur & Blanc, 1967 .....	13
<i>Lygodactylus guibei</i> Pasteur, 1964 .....	15
<i>Lygodactylus madagascariensis</i> (Boettger, 1881) .....	17
<i>Lygodactylus miops</i> Günther, 1891 .....	20
<i>Lygodactylus rarus</i> Pasteur & Blanc, 1973 .....	23
<i>Lygodactylus pictus</i> group .....	24
<i>Lygodactylus pictus</i> (Peters, 1883) .....	27
<i>Lygodactylus tuberosus</i> Mertens, 1965 .....	29
<i>Lygodactylus roavolana</i> <b>sp. nov.</b> .....	32
<i>Lygodactylus mirabilis</i> group .....	34
<i>Lygodactylus blanci</i> Pasteur, 1967 .....	37
<i>Lygodactylus intermedius</i> Pasteur, 1995 .....	38
<i>Lygodactylus mirabilis</i> (Pasteur, 1962) .....	40
<i>Lygodactylus montanus</i> Pasteur, 1964 .....	42
<i>Lygodactylus verticillatus</i> group .....	44
<i>Lygodactylus arnouliti</i> Pasteur, 1964 .....	47
<i>Lygodactylus blancae</i> Pasteur, 1995 .....	49
<i>Lygodactylus decaryi</i> Angel, 1930 .....	51
<i>Lygodactylus heterurus</i> Boettger, 1913 .....	52
<i>Lygodactylus klemmeri</i> Pasteur, 1964 .....	55
<i>Lygodactylus verticillatus</i> Mocquard, 1895 .....	57
Species not assigned to any species group .....	59
<i>Lygodactylus ornatus</i> Pasteur, 1964 .....	59
<i>Lygodactylus pauliani</i> Pasteur & Blanc, 1991 .....	63
<i>Lygodactylus tolampyae</i> (Grandidier, 1872) .....	64
<i>Microscalabotes bivittis</i> (Peters, 1883) .....	67
Discussion .....	69

Morphological variability .....	69
Genital morphology .....	70
Phylogenetic relationships .....	70
Biogeography, microendemism and conservation .....	71
Acknowledgements .....	72
References .....	72
Appendix: Identification key.....	75

## Abstract

The Malagasy species of the dwarf gecko genera *Lygodactylus* Gray and *Microscalabotes* Boulenger have been largely neglected in recent studies on the herpetofauna of Madagascar. Since the historically earliest taxonomic description of *Lygodactylus tolampyae* in 1872, studies have mainly dealt with the systematics of these lizards, yet many taxonomic issues and the validity of several species is unclear. Some species have been described on the basis of immature specimens, or based on a low specimen number from single sites, and there are no assessments of geographic variation. In this paper we provide a review of Malagasy *Lygodactylus* and *Microscalabotes* based on preserved material from a number of major natural history museums, including types of most species, and on own collections. For each species we provide morphological diagnoses, standardized descriptions of up to 24 morphological characters, a list of localities, and discussions of geographical variation if it was apparent from the specimens examined. All except three Malagasy *Lygodactylus* species are assigned to a total of four phenetic species groups of which at least some may also represent monophyletic units. Hemipenial morphology is described for 11 species and provides a valuable source of characters to distinguish species groups, especially the *L. madagascariensis* group that differs from other Malagasy species by their lack of hemipenial serrated ridges with pointed papillae, short pedicel and poorly defined lobes. *Lygodactylus praecox* Pasteur, 1995 is considered as a junior synonym of *Lygodactylus klemmeri* Pasteur, 1964. One new species, *Lygodactylus roavolana*, is described based on a unique combination of morphological characters.

**Key words:** Squamata, Gekkonidae, *Lygodactylus*, *Millotisaurus*, *Domerguella*, *Microscalabotes*, Madagascar, taxonomy, identification key, systematics, biogeography.

## Introduction

*Lygodactylus* Gray is a genus of small and mostly cryptic lizards belonging to the family Gekkonidae, with round pupils and diurnal habits. The genus includes about 60 species, with a scattered distribution in Brazil (two species, often classified in a separate genus *Vanzoia*), sub-Saharan Africa (36 species), Madagascar (20 species), and Juan de Nova Island (one poorly known, endemic species, *L. insularis*). In addition, there is one species in the genus *Microscalabotes* Boulenger which is closely related to or even nested within *Lygodactylus* (Puente *et al.* 2005b). In Madagascar, *Lygodactylus* occupy different kinds of environments: there are rainforest and dry forest species usually living on trees, species of the arid spiny forest, and species adapted to high mountain habitats up to 2700 m which usually are found on rocks. All Malagasy species are regional endemics, occurring on Madagascar and its offshore islands, with one species being present also on Europa island in the Mozambique channel (*L. verticillatus*).

Morphology of these lizards, to which we here refer as Malagasy dwarf geckos, is superficially very similar among species. Possibly related to the variety of ecological adaptations, there is a wide array of differences in scale characters which, however, cannot be examined without optical aid (at least strong magnification lenses). Field identification is therefore very difficult and prone to errors. Furthermore, diagnosis of species is usually based on the combination of several characters of the scalation of body and head, and exceptional states in many of these characters are known to occur. One species was described on the basis of immature specimens, and there are several species for which a low number of individuals are known and knowledge on variation is therefore scarce.

The taxonomy of Malagasy dwarf geckos has been dealt with usually in terms of descriptions of new species and subspecies, by several authors (Grandidier 1872; Boettger 1881, 1913; Peters 1883; Günther