



A new genus of polystomatid parasitic flatworm (Monogenea: Polystomatidae) without free-swimming life stage from the Malagasy poison frogs

LOUIS H. DU PREEZ¹, LILIANE RAHARIVOLOLONIAINA², OLIVIER VERNEAU³ & MIGUEL VENCES⁴

¹School of Environmental Sciences and Development, North-West University, Potchefstroom campus, Private Bag X6001, Potchefstroom 2520, South Africa. E-mail: Louis.duPreez@nwu.ac.za

²Département de Biologie Animale, Université d'Antananarivo, Antananarivo 101, Madagascar. E-mail: raharivololoniaina@yahoo.fr

³UMR 5244 CNRS-UPVD, Biologie et Ecologie Tropicale et Méditerranéenne, Parasitologie Fonctionnelle et Evolutive, Université de Perpignan Via Domitia, 52 Avenue Paul Alduy, 66860 Perpignan Cedex, France. E-mail: verneau@univ-perp.fr

⁴Zoological Institute, Technical University Braunschweig, Spielmannstr. 8, 38106 Braunschweig, Germany. E-mail: m.vences@tu-be.de

Abstract

Madapolystoma n. g. (Monogenea, Polystomatidae), is proposed for a new genus of polystomatid from the urinary bladder of the Malagasy poison frogs of the genus *Mantella* (family Mantellidae), with the description of one new species. This is the second anuran polystome to be described from Madagascar. The parasites are small with a maximum body length of less than 3 mm. The two gut caeca have a few diverticulae but no prehaptoran anastomoses and are confluent posteriorly. The haptor bears six well-developed suckers and one pair of hamuli. A single small ovary lies in mid-body while the single follicular testis lies posteriorly in the body. Vaginae are present. The new genus is unique among all known polystomes in that it apparently has no free-swimming ciliated larvae but instead is characterized by advanced intra-uterine development with larvae developing hamuli and even suckers while still *in utero*. Based on molecular phylogenetic data, the closest relative of *Madapolystoma* is the genus *Eupolystoma* from Africa. Madagascar has a very diverse anuran fauna with a 100% level of endemicity at the species level, and more *Madapolystoma* species from other mantellid hosts await description.

Key words: Monogenea, Polystomatidae, *Madapolystoma*, *Mantella*, Madagascar

Introduction

Madagascar's unique biota evolved under isolation for an extended period of time (Goodman & Benstead 2003; Glaw & Vences 2007). As initial part of the Gondwana supercontinent the island has been separated from India for *ca* 96–84 Myr (Storey *et al.* 1995; Briggs 2003) and from Africa for *ca* 165–158 Myr (Rabinowitz *et al.* 1983; Briggs 2003). Various hypotheses have been postulated to explain the species rich and endemic anuran diversity of Madagascar. Some of the endemic frog lineages dispersed directly from Africa during the Late Cenozoic (Vences *et al.* 2003; Yoder & Nowak 2006) while the most species rich endemic family Mantellidae and endemic representatives of the Microhylidae appear to be more ancient and have reached Madagascar in the Late Cretaceous or Early Cenozoic (Van Bocxlaer *et al.* 2006; Van der Meijden *et al.* 2007). Madagascar is ranked high in terms of species diversity, endemicity and threats to species ever since Myers *et al.* (2000) identified 25 geographical areas as biodiversity conservation 'hot spots'. This island is ranked as the second most important "hot spot" in terms of biodiversity conservation. The current inventory of scientifically named Madagascan anurans includes about 265 species, however this is a significant under-estimation and the true species diversity comprises at least 373 but possibly as many as 465 species (Vieites *et al.* 2009).

Polystomatids are endoparasitic monogenetic flatworms infecting aquatic and amphibious tetrapods with the majority in anurans and freshwater chelonians. Thus far 23 genera have been recognised within the Polystomatidae, containing more than 200 species. Polystomes most likely arose 425 Myr ago during the transition