

Two Unknown Arboreal Frogs (genus *Platypelis*) Described from the Rainforests of Northeastern Madagascar (Microhylidae: Cophylinae)

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Abstract: Two new arboreal microhylid frogs are described from the rainforests of northeastern Madagascar. *Platypelis tetra* is a very small frog, reaching about 20 mm SVL, and inhabits phytotelms in screw *Pandanus* pines. It was found in some low and mid-altitude rainforests, such as Anjanaharibe-Sud, Besariaka, Tsararano, and Masoala Peninsula. This species diverges from the other *Platypelis* by its small size and colouration, with a series of whitish spots on the back, of which four are more evident. Furthermore, its advertisement call is composed by a long series of discrete notes at about 3.5–4 KHz of frequency, and a repetition rate of about 3.0 notes/s. The second species, *Platypelis mavomavo*, reaches a larger size (about 30 mm SVL), and is characterized by a yellowish colouration of the ventral surface, and a dorsal surface with a network of dark spots on a beige-yellow background. It is currently known from Anjanaharibe-Sud and Ambolokopatrika, around the Andapa water-basin, but is expected to have a wider distribution.

Key words: Amphibia; Anura; Microhylidae; *Platypelis*; New species; Madagascar

INTRODUCTION

Madagascar is well known for its biodiversity and high endemism (Glaw and Vences, 1994). Amphibians are no exception with more than 210 endemic species (Andreone and Luiselli, 2003) and many others still in wait for description. Like other vertebrates of Madagascar (e.g., fish and mammals, see Benstead et al., 2000; Yoder et al., 2003), the frogs of

this landmass belong to a few families, of which they represent an offshoot radiation. According to recent studies (Vences and Glaw, 2001) they are included in four families: Ranidae, Mantellidae, Microhylidae, and Hyperoliidae. Of these, the microhylids are still the most enigmatic clade, and their phylogenetic and taxonomic relations are largely unstudied. Of the three recognized Malagasy subfamilies (Dyscophinae, Scaphiophryninae, and Cophylinae), the cophylines account for a high number of species inhabiting rainforests and secondary altitude savannahs (Andreone, 1999). Indeed, little is known of their ecology and distribution

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except that they are specialized to a variety of microhabitats: e.g., the enigmatic *Rhombophryne testudo* and some *Plethodontohyla* species (such as *P. ocellata*, *P. alluaudi*, and *P. serratopalpebrosa*) are fossorial or terrestrial, the small *Stumpffia* are adapted to leaf-litter, and most of the *Anodonthyla*, *Platypelis*, *Cophyla*, and some *Plethodontohyla* are arboreal or semiarboreal. The conditions and evolutionary pressures that led to such a dramatic ecological radiation in these frogs are unknown. Further, whether an ecologically specialised group is indeed monophyletic is the subject of a separate work (Andreone et al., in press).

One reason for the lack of knowledge about cophyline microhylids is that they often lead a cryptic life, which makes their study difficult. In fact, many taxa are known from a few specimens and are only occasionally rediscovered (e.g., *Plethodontohyla coudreau*; Andreone, in press a). This was confirmed by our own experience: during field surveys we often found specimens that could be grouped with one another representing the same ecological and morphological cluster, but were difficult to assign to any known taxon. This leads us to the idea that, especially in microhylids, many more species await description, and it is not an exaggeration to affirm that most likely the final number of species will stabilize around the double that currently known. Many of these specimens still await description and will be the object of further contributions, using both traditional (e.g., morphological analysis and comparisons of museum samples), and other methods (e.g., acoustics, karyology, DNA). While it is important to collect ecological and natural history information on unknown species, the discovery and rapid description of new frogs from Madagascar is important for two reasons: (1) it accelerates the cataloguing of the whole Malagasy batrachofauna, providing powerful tools to draw biogeographic relationships for conservation actions (see Andreone and Luiselli, 2003), and (2) it helps clarify the taxonomy and phylogeny of this subfamily in a region where

deforestation outpaces description. Written records and museum specimens might become all we have for future studies of the most sensitive species, which are rapidly vanishing.

The present paper is just a step in this direction and deals with the description of two new *Platypelis* that we found in northeastern Madagascar. One of these frogs is a *Pandanus*-specialized *Platypelis*, while the second is an arboreal generalist. They are sufficiently divergent from all known *Platypelis*, in both morphology and bioacoustics, to warrant description here.

MATERIALS AND METHODS

We searched for frogs during the night with the help of flashlights. Vocalizing males were located by following calls at sunset or during rainfall. One species described here is a microhabitat specialist, living within phytotelmata of screw-pines, *Pandanus* sp., and we spent daytime hours searching the leaf axils of these plants. After capture and photography of live colouration, specimens were sacrificed after anaesthesia in chlorobutanol, fixed in 4% formalin or 90% ethanol, and preserved in 70% ethanol. They are currently deposited in the Museo Regionale di Scienze Naturali, Torino (MRSN).

Measurements follow standard methods, using digital callipers or the dissecting microscope's micrometer (to the nearest 0.1 mm): SVL (snout-vent length), HW (head width), HL (head length, from the maxillary commissure to the snout tip), ED (horizontal eye diameter), END (eye-nostril distance), NSD (nostril-snout tip distance), NND (inter-narial distance), TD (horizontal tympanum diameter), HAL (hand length, from the carpal-metacarpal articulations to the tip of the longest finger), FORL (forelimb length, from the axilla to the tip of the longest finger), HIL (hindlimb length, from the cloaca to the tip of the longest toe), FOL (foot length, from the tarsal-metatarsal articulations to the tip of the longest toe), FOTL (foot length including tarsus, from the tibiotarsal articulation to the