

## Correspondence

**A case of male egg guarding behaviour in a stream-dwelling frog,  
*Mantidactylus (Ochthomantis)* sp. (Anura: Mantellidae),  
from northeastern Madagascar**

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Parental care is not a commonly observed phenomenon among anurans; it has been demonstrated in approximately 6% of all species (CRUMP 1996), but the real number of species in which parental care occurs is likely higher. The most common type of parental care in frogs is attendance of eggs (WELLS 1981). Reports about parental care in Malagasy amphibians are rare and only known for a handful of species (LEHTINEN 2003, GLAW & VENCES 2007).

During the dry season of 2012, a small stream in mid-altitude primary rainforest, located in the northern part of the Betaolana corridor (14°28'58" S, 49°33'07" E, ca. 950 m a.s.l.; obtained using GoogleEarth), was surveyed for frogs during four consecutive nights. This mountain chain connects the protected areas Anjanaharibe Sud and Marojejy in northeastern Madagascar (Antsiranana province). Specimens of *Mantidactylus* sp. (subgenus *Ochthomantis*) were commonly encountered near the water on rocks, driftwood and tree branches. Based on photos and external morphology alone, they could not be assigned to a described or one of the candidate species (RANDRIANIAINA et al. 2011) that still await formal description. The taxonomy of this group is in need of revision, and cryptic species diversity is higher than previously thought (GLAW & VENCES 2004), with northern Madagascar being considered to be a centre of diversity (RABIBISOA 2008).

On 24 May 2012 between 19:00 and 21:00 h (air temperature 20.4°C), a clutch of 24 greyish frog eggs containing developing embryos at GOSNER stage 16 (GOSNER 1960) was found on a branch 1.5 m above a slow-flowing stretch of the stream. Stream width at this site was 2.5 m with a maximum depth of about 0.25 m. The eggs were stuck together as a clump. Mean diameter (jelly capsule + ovum) was 4.0 mm (n = 7). An adult specimen of *Ochtho-*

*mantis* sp. (snout–vent length 41.2 mm) was sitting on the clutch, covering the eggs with the anterior half of its venter. In the consecutive night (same time period; air temperature 21.3°C), the same specimen was again found on the branch, slightly distant to the clutch (Fig. 1). It was identified as an adult male by the presence of distinct femoral glands (Fig. 2); femoral glands in female *Ochthomantis* are of a much smaller size (GLAW & VENCES 2007). Although the reproduction of this species is unknown, the clutch is tentatively assigned to the same species due to the presence of the mature male on and next to the clutch, respectively.

Male egg-guarding behaviour in the genus *Mantidactylus* (including those species that are now placed in other genera) is known from *Blommersia* cf. *domerguei* (ALTIG 2008), *Guibemantis bicalcaratus* and *G. punctatus* (LEHTINEN 2003), *Mantidactylus (Maitsomantis) argenteus* (GLAW & VENCES 1994), *M. (Ochthomantis) majori* (VENCES & DE LA RIVA 2005, ALTIG 2008), and *M. (Ochthomantis) mocquardi* (J. GLOS pers. comm.). The male's position on the clutch might have been related to his assuming a protective function, e.g., by expending moisture to the eggs via his body surface and keeping diseases and predators away (GLAW & VENCES 2007).

Species of the subgenus *Ochthomantis* and *Mantidactylus argenteus* show relatively close relationships, as was supported by molecular data (GLAW & VENCES 2006) and tadpole morphology (VEJARANO et al. 2006). The observation described here indicates that egg attendance by males might be expected to be more widespread in this subgenus. However, information on the biology of these frogs and other *Mantidactylus* is sparse and further in situ studies are required to clarify whether male egg care is a common trait in these stream-dwellers.



Figure 1. Adult male of *Mantidactylus* (*Ochthomantis*) sp. guarding a clutch of 24 eggs.



Figure 2. Ventral view of the egg-guarding male described in the text; note the presence of femoral glands on the thighs.

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