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A new finding of *Uroplatus alluaudi* in north-eastern Madagascar widens considerably its distribution range (Reptilia, Gekkonidae)

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Abstract. The presence of *Uroplatus alluaudi* in NE Madagascar (Besariaka Forest) is here reported. This record enlarges considerably the species' distribution range, up to now restricted to Montagne d'Ambre. The new specimen fits totally in morphology, colouration and body scalation with specimens from the type locality. Considerations are also provided on its conservation at the light of the updated distribution.

Keywords. Reptilia, Gekkonidae, *Uroplatus*, distribution, Madagascar.

The Madagascan endemic genus *Uroplatus* currently includes 12 species of nocturnal and arboreal geckoes widespread in most of the rainy and dry forests of Madagascar, typical for their secretive habits and cryptic morphology and colouration (Glaw and Vences, 1994).

Indeed, one of the least known species is *U. alluaudi*. This gecko is peculiar in being featured by a less "extreme" morphology, with a body that is not so flattened as in other species, and with dermal fringes limited to the tail. So far, *U. alluaudi* was only known from its type locality, Montagne d'Ambre (Glaw and Vences, 1994; Raxworthy and Nussbaum, 1994), while a likely related species, *U. malahelo* was described from the South of Madagascar (Nussbaum and Raxworthy, 1994).

On the occasion of field surveys in north-eastern regions (Andreone, 2004), we collected a further individual of *U. alluaudi*. This represents a remarkable novelty in terms of distribution, since it indicates that the species is not limited to the isolated northern rainforest of Montagne d'Ambre (Fig. 1). The single individual is a male, and was collected by J.E. Randrianirina on 28 April 1996 at Besariaka forest, Campsite 1 (Ambinaninimiakamidina), Andapa Fivondronana, Antsiranana (Diégo Suarez) Province, 14°49.30'S, 49°3.25'E, about 940 m a.s.l. Besariaka is a classified forest at about 60 km south of Andapa, delimited at the north by the Reserve Spéciale d'Anjanaharibe-Sud, and southwards by the Tsararano Chain. The forest is rather degraded, especially in parcels far from streams.

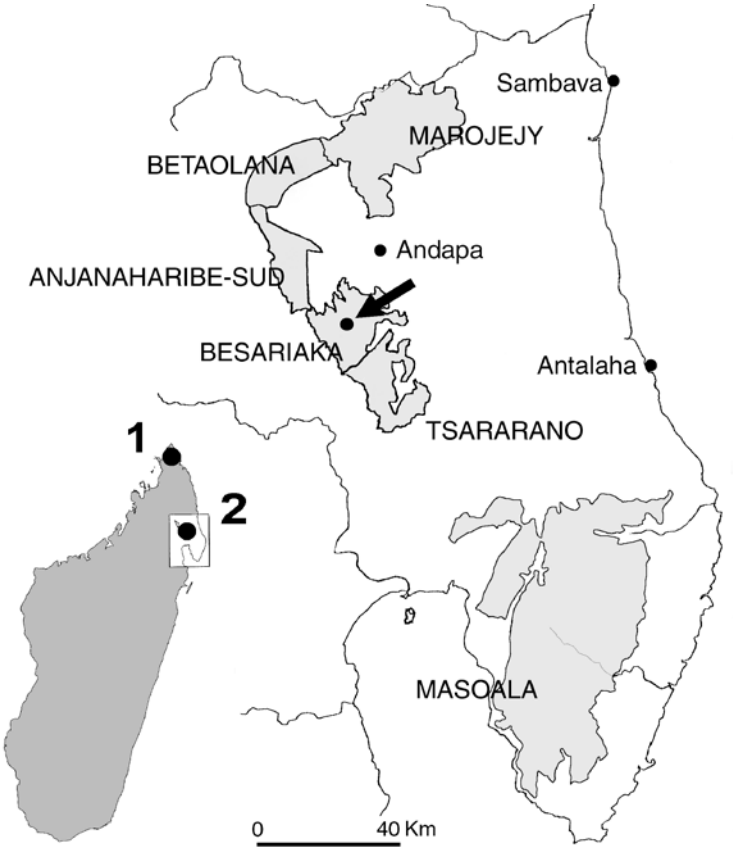

Fig. 1. Location of Besariaka Forest (where the new individual of *Uroplatus alluaudi* MRSN R1630 was found) and of other forest sites around Andapa, NE Madagascar. The arrows indicates the campsite, while the two points on the smaller map of Madagascar refer to Montagne d'Ambre (1) and Besariaka (2).

This is due to several reasons, among which the use of forest areas for cattle, cutting of trees by villagers, use of path systems, and for hunting (Andreone et al., 2000).

The individual was found overnight at about 2 m of elevation from the ground (h 19:30). After capture it was anaesthetised with a clorobutanol injection, and fixed in 4% formalin. Then it was conserved in 70% ethanol and housed in the herpetological collection of the Museo Regionale di Scienze Naturali (Torino), under the number MRSN R1630. After about 10 years of conservation this specimen is still in very good conditions, with the tail in good shape and attached to the body (Fig. 2).

To ascertain and confirm its specific determination we compared it to two *U. alluaudi* from Montagne d'Ambre, housed in Zoologische Staatssammlung München: ZSM 275/2004 (field number FGZC [F. Glaw Zoological Collection] 528, collected by F. Glaw, M. Puente, R. Randrianiaina and A. Razafimanantsoa, 24 February 2004; and ZSM 251/2004 (FGZC 490, same collectors, collected 20 February 2004). All the specimens

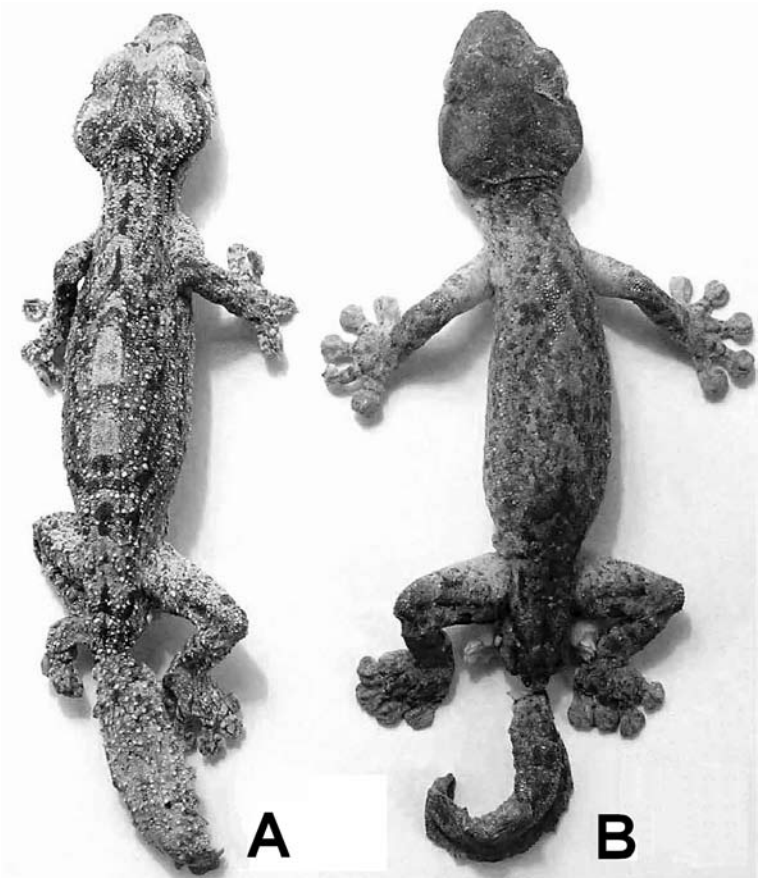

Fig. 2. Dorsal view of two preserved specimens of *Uroplatus alluaudi.* (A) the new individual from Besariaka (MRSN R1630), (B) ZSM 275/2004 from Montagne d'Ambre.

were measured by the senior author with a hand calliper (precision: 0.1 mm) for standard lengths: snout-vent length (from the tip of the snout to the cloaca); tail length (from the cloaca to the tip of the tail); maximum tail width; head length from the tip of the snout to the jaw articulation; maximum head width; eye diameter, from the snout the nostril, and nostril-eye (Table 1).

The specific attribution to *U. alluaudi* for the Besariaka specimen is thus justified for the following reasons: (1) the body size, morphology and colouration are very similar in all the three specimens compared, (2) the hemipenial morphology too is almost identical; (3) the Besariaka specimen differs from *U. malahelo,* which has an uniform scalation, in having scattered conical turbercles among the smaller, flat, juxtaposed scales (Fig. 3), which is a character diagnostic of *U. alluaudi* (Nussbaum and Raxworthy, 1994). Furthermore, all the three specimens share an undivided rostral scale, this being a diagnostic character between the species pair *U. alluaudi* / *U. malahelo* (undivided scale) and *U.*

Table 1. Morphometric measurements (to 0.1 mm) of the analysed *Uroplatus alluaudi* specimens from Besariaka and Montagne d'Ambre. For abbreviations see the text.

	MRSN R1630	ZSM 275/2004	ZSM 251/2004
Sex	Male	Male	Male
Provenance	Besariaka	M. d'Ambre	M. d'Ambre
Snout-vent length	76.4	77.4	82.2
Tail length	37.9	29.0	30.3
Tail width	11.4	12.5	10.6
Head length	16.1	16.2	16.8
Head width	16.7	16.4	15.7
Eye diameter	6.6	6.1	7.5
Snout-nostril	2.9	3.3	3.3
Nostril-eye	7.4	7.9	6.6

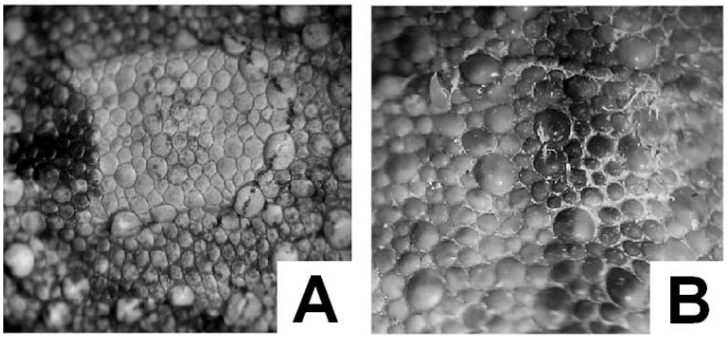

Fig. 3. Details of the dorsal skin texture of *Uroplatus alluaudi.* (A) MRSN R1630 (from Besariaka), and (B) ZSM 275/2004 from Montagne d'Ambre, both showing the presence of heterogeneous scalation.

guentheri (divided rostral scale), a species that is known from NW Madagascar (Nussbaum and Raxworthy, 1994).

The updated distribution of *U. alluaudi* at the light of the present finding is therefore much wider than formerly believed, and indicates that the species, although likely restricted to northern Madagascar, is not a Montagne d'Ambre endemic. Besariaka is about 180 km south of Montagne d'Ambre (Fig. 3). Evidently, *U. alluaudi* is not a common species, although it is likely that its secretive habits plays an important role in the fact that only a few individuals have been collected until now.

Within the National Park of Montagne d'Ambre *U. alluaudi* benefits from a certain protection, although in the past a certain number of specimens were possibly captured and exported for the pet-trade. At Besariaka the habitat conditions are uncertain, since

this area, at least at the time during which the specimen was collected, was already highly degraded. Regardless, based on the current distribution, we suspect that the species might be also present in the regions between Montagne d'Ambre and Besariaka, such as Anjanaharibe-Sud, Ambolokopatrika, and Marojejy. In this case the persistence of major forest blocks and homonymous protected areas would likely warrant its protection.

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