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## **An addition to the East African herpetofauna: the first record of *Tarentola annularis relict* (Squamata: Gekkonidae) in Uganda**

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**Abstract.** This is the first record of a member of the genus *Tarentola* from Uganda. Population of *Tarentola annularis relict* was found in Ubbi village on the South-Western foot of Mt. Otzi in northern Uganda, close to the border with Sudan. Brief comments on extraordinary biogeographical affinities of the area and characterization of the Mt. Otzi environments are provided.

**Key words:** *Tarentola*, Uganda, East Africa, Mt. Otzi, new geographic record.

### INTRODUCTION

In their account of the East African reptiles, Spawls et al. (2004) listed 55 species of geckoes in 11 genera for East Africa including Tanzania, Kenya, Uganda, Rwanda and Burundi. Although biogeographically, the East African realm includes also parts of South Sudan and Ethiopia, we follow the above mentioned political delimitation of East Africa used throughout literature for practical reasons. During a short survey of the Mt. Otzi area in the very North of Uganda on 9.X.2006, we collected specimens of geckoes, that did not match any known East African genus. Specimens were collected on buildings of the village school in Ubbi, a small settlement at the South-Western foot of Mt. Otzi. Upon collection, the animals were photographed and released at the original collection site.

The Ubbi village (03°35'07"N, 31°49'42"E, elevation of 690 m a.s.l.) is surrounded by a mosaic of farmland, small rocky hillocks covered by bushy vegetation and numerous rocky outcrops devoid of vegetation (Fig. 1a). The area is situated in the Southern Sudanian savanna zone, the natural vegetation of which is mostly tree and shrub moist savanna. The dominant geomorphological feature of the area is the Mt. Otzi massif steeply rising above surrounding landscape. The Mt. Otzi located on the Western bank of the Nile River has an undulating top plateau with

several emergent rocky peaks reaching a maximum elevation of 1565 m. Its slopes are covered by bush, while its upper parts are covered by a mosaic of highland bush, moist forest and farmland (Fig. 1b). The remaining forest patches are mostly degraded by logging and clearing for agriculture and thus characterized by relatively open canopy (Fig. 1c). The area south of the Mt. Otzi is dominated by palm- and other moist-savanna types (Fig. 1d).

### *Tarentola* specimens

The geckoes were assigned to the genus *Tarentola* according to absence of claws on digits 1, 2 and 5 and presence of claws on digits 3 and 4 (as seen in Figs 2a–b). The only *Tarentola* species occurring thus far in the South-East of the genus range is *Tarentola annularis* (Geoffroy, 1809), in which two subspecies are recognized (Joger 1984). The nominotypic *Tarentola annularis annularis* (Geoffroy, 1809) occurs throughout the Saharan region, whereas *Tarentola annularis relict* Joger, 1984 is known only from two disjunct areas – the Nile valley in the very south of Sudan and Mora in the North Cameroon south of the Lake Chad. Two confirmed Sudan localities include Juba (type locality of the subspecies) and Nimule (Joger 1984).



**Fig. 1.** Landscape and vegetation of the Mt. Otzi and adjacent areas. **Fig. 1a.** Rocky outcrops in Ubbi village on the foot of Mt. Otzi. Photograph A. D. Mihalca. **Fig. 1b.** Forest patch on the Mt. Otzi top plateau with an emergent rocky peak in the background. Photograph M. Jirků. **Fig. 1c.** Interior of the Mt. Otzi forest showing relatively open canopy and distinct Afrotropical floristic element, the false banana of the genus *Ensete* in the foreground. Photograph M. Jirků. **Fig. 1d.** Palm savanna south of the Mt. Otzi region in the Murchinson Falls NP, Uganda. Photograph M. Jirků.



**Fig. 2.** *Tarentola annularis*. **Fig. 2a.** Adult specimen of *Tarentola annularis relictica* from Ubbi, Uganda. Photograph D. Modrý. **Fig. 2b.** Close-up of adult specimen of *Tarentola annularis relictica* from Ubbi, Uganda. Note the bright red trombiculid mites localized mainly around eye. Photograph D. Modrý. **Fig. 2c.** Adult specimen of *Tarentola annularis annularis* from Awash NP, Ethiopia. Note the four distinct white, dark-rimmed scapular flecks. Photograph P. Necas.

Apart from details in scaling patterns, *T. a. relictica* can be readily distinguished visually by an absence of four white, dark-rimmed scapular flecks typical for the nominotypic subspecies (compare Figs 2a–b with Fig. 2c). Based on

coloration pattern, the specimens we collected in Uganda can be assigned to the subspecies *T. a. relictica*. All observed specimens were pale-grey colored with orange to orange-brown blotches on dorsum of the head and body

with intervening irregularly distributed faint whitish flecks devoid of any dark margin, whereas the tail possessed just faint grayish transversal bands (Figs 2a–b). As far as we are aware, the Figs 2a–b are the first published color photographs of live *T. a. relicta*.

## BIOGEOGRAPHICAL CONSEQUENCES

To our best knowledge, the presented record of *Tarentola* in Uganda is the first record of the genus in the East African region as defined above. The genus *Tarentola* comprises 20 species distributed throughout the dry regions of the Mediterranean, Middle East, some Atlantic archipelagos (e.g. Canary and Cape Verde Islands) and African mainland north of the savanna and forest zones (see Joger 1984 for review). Three additional species are known from the West Indies (Diaz & Hedges 2008, Joger 1984). The African-mainland part of the genus geographic range, i.e. Saharan region, comprises a total of six species (including *Tarentola chazaliae*, still treated by some authors as the only representative of the monotypic genus *Geckonia* – see Carranza et al. 2002) the speciation of which seems to reflect the relatively recent aridification of the Sahara desert region, which was gradually colonized from its rather mesic margins by ancestors of extant species since mid Oligocene. In general, the southern distribution limit of *Tarentola* spp. in African mainland is delimited by an interference zone between the southern margin of the arid Sahel belt and moist savanna and forest equatorial zones.

To date, the southernmost confirmed locality of *Tarentola* has been the record of *T. a. relicta* from Nimule (03°35'33"N, 32°04'14"E), on the Sudanian side of the Sudan-Uganda border. The southern records of *T. a. relicta* in Sudan and Uganda document an intrusion of Saharan faunistic element into the relatively humid equatorial region which is dominated by moist savanna approximately from 9°30'N southwards. Presence of the reptile species associated with arid habitats here, deep in the savanna zone might be facilitated by a presence of an extensive network of huge rocky outcrops and ridges following Aswa fault, which extend into this region from far north-west and of which the Mt. Otzi is a magnificent southernmost outpost. It is possible, that these exposed rocky formations, largely devoid of vegetation, might serve as refuges for Saharan taxa that normally would not occur thus far south in the otherwise relatively humid region. Farther to the south from the Mt. Otzi region, the landscape is dominated by gently undulating plains covered by various moist-savanna types (Fig. 1d) where presence of *Tarentola* seems unlikely due to lack of suitable habitats.

Interestingly, the Mt. Otzi region is the easternmost known locality of a remarkable West-African savanna element, the ball python *Python regius*, which was collected in the vicinity of Moyo (3°39'14"N, 31°43'22"E), just 13 km to the north-west from the Ubbi village reported here to be (together with Nimule) the southernmost locality of *Tarentola*.

Apart from the two outstanding herpeto-faunistic elements, *P. regius* and *T. a. relicta*, representatives of the West African and Saharan realm(s) respectively, the region is mostly inhabited by East-African herpetofauna as reflected by distribution maps provided by Spawls et al. (2004). In addition, there is a relict population of eastern chimpanzee *Pan troglodytes schweinfurthii* on the Mt. Otzi (Caldecott & Miles 2005), which together with colobus monkey *Colobus guereza* (pers. obs.) in the Otzi forest show clear faunistic affinity to the Guineo-Congolian rainforest block. Finally, a presence of false bananas of the genus *Ensete* (pers. obs., Fig. 1c) in the Otzi forest suggests also presence of Afromontane elements in the area. In conclusion, the Mt. Otzi region deserves further attention as a potential biogeographical match point, where East- and West-African (savanna), Saharan (desert), Central-African (forest-savanna) and possibly Afromontane biotas meet at one place.

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