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African Journal of Herpetology

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/ther20

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AFRICAN JOURNAL OF HERPETOLOGY
https://doi.org/10.1080/21564574.2023.2246487

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A new species of African legless skink, genus *Acontias* Cuvier, 1816 "1817" (Squamata: Scincidae) from Serra da Neve inselberg, south-western Angola

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ABSTRACT

During a recent survey of the Serra da Neve inselberg in south-western Angola, a population of legless skinks of the genus *Acontias* was found. Only three species of this genus have been recorded for the country so far – *A. occidentalis*, *A. kgalagadi* and *A. jappi*. Using an integrative approach and combining molecular and morphological data we found that the Serra da Neve population represents a new species, closely related to species such as *A. percivali* and some members of the *A. occidentalis* species complex. In this paper, we describe this population as a new species, *Acontias mukwando* **sp. nov.** and provide brief comments on its conservation and biogeography.

ASSOCIATE EDITOR
H Farooq

KEYWORDS
Acontinae; taxonomy; endemism; speciation; systematics

RESUMO

No decorrer de um levantamento herpetológico da ilha-montanha da Serra da Neve no sudoeste de Angola, descobriu-se uma população de escincos-lança do género *Acontias*. Apenas três espécies deste género foram até agora registadas para Angola - *A. occidentalis*, *A. kgalagadi* and *A. jappi*. Adotando uma abordagem integrativa e combinando dados morfológicos e moleculares, os nossos resultados indicam que a população da Serra da Neve representa uma nova espécie, com relações próximas a outras espécies rupícolas tais como *A. percivali* e membros do complexo de espécies *A. occidentalis*. Neste artigo descrevemos esta população como uma nova espécie, *Acontias mukwando* **sp. nov.** e apresentamos breves comentários sobre a sua conservação e biogeografia.

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The species is registered in ZooBank under: *Acontias mukwando* **sp. nov.**: urn:lsid:zoobank.org:act:C4FEAA66-8E0B-480C-B444-18ED8175E735
This article is registered in ZooBank under: urn:lsid:zoobank.org:pub:9BDCDD14-F4C4-45BC-ADA9-5355C48D5668

African Journal of Herpetology is co-published by NISC Pty (Ltd) and Informa Limited (trading as Taylor & Francis Group)

Published online 19 Sep 2023

Introduction

African limbless skinks (Squamata: Scincidae) are distributed among two main subfamilies: Scincinae Gray, 1825, and Acontinae Gray, 1839. While the subfamily Scincinae has a global distribution, a vast diversity of body plans including fully limbed animals and 31 different genera (Uetz et al. 2023), the Acontinae is endemic to Africa and comprises solely limbless species in the genera *Acontias* Cuvier, 1816 "1817" and *Typhlosaurus* Wiegmann, 1834 (Lamb et al. 2010; Uetz et al. 2023; Zhao et al. 2023). As defined by Greer (1970), members of the Acontinae are completely limbless, generally possess incomplete supratemporal arches, a closed Meckel's groove, and a complex secondary palate, lack pterygoid teeth, and are viviparous. The phylogeny and biogeography of the Acontinae have been subject to recent studies (Daniels et al. 2002, 2005, 2006, 2009; Whiting et al. 2003; Lamb et al. 2010; Engelbrecht et al. 2012; Busschau et al. 2017; Pietersen et al. 2018; Zhao et al. 2019, 2023) and several new species have been described (Wagner et al. 2012; Conradie et al. 2018).

Reviews of the Acontinae were originally provided by Broadley (1968), Broadley and Greer (1969) and Greer (1970), but knowledge regarding this group has increased considerably since then. Broadley (1968) provided a diagnosis and a taxonomic revision of the genus *Typhlosaurus* as then construed. According to the author, the genus included *T. cregoi bicolor* Hewitt, 1929, *T. cregoi cregoi* (Boulenger, 1903), *T. aurantiacus aurantiacus* (Peters, 1854), *T. aurantiacus fitzsimonsi* Broadley, 1968, *T. lineatus subtaeniatus* Broadley, 1968, *T. lineatus lineatus* Boulenger, 1887, *T. lineatus jappi* Broadley, 1868, *T. gariepensis* FitzSimons, 1941, *T. meyeri* Boettger, 1894, *T. caecus* (Cuvier, 1817), *T. vermis* Boulenger, 1887, and *T. braini* Haacke, 1964. In a subsequent paper, Broadley and Greer (1969) provided a comparable review of *Acontias* as then construed, which at the time included 13 taxa, namely *A. plumbeus* Bianconi, 1849, *A. breviceps* Essex, 1925, *A. gracilicauda gracilicauda* Essex, 1925, *A. gracilicauda namaquensis* Hewitt, 1938, *A. percivali percivali* Loveridge, 1935, *A. percivali occidentalis* FitzSimons, 1941, *A. percivali tasmani* Hewitt, 1937, *A. meleagris meleagris* (Linnaeus, 1758), *A. meleagris orientalis* Hewitt, 1937, *A. lineatus lineatus* Peters, 1879, *A. lineatus grayi* Boulenger, 1887, *A. lineatus tristis* Werner, 1911, and *A. litoralis* Broadley and Greer, 1869. Greer (1970) followed Broadley (1968) and Broadley and Greer (1969) in his interpretation of these genera, but also considered the monotypic genus *Acontophiops* Sternfeld, 1912, which included the single species *Acontophiops lineatus* Sternfeld, 1912 [currently *Acontias rieppeli* Lamb, Biswas and Bauer] as a valid member of the Acontinae. Broadley (1990) and Bourquin and Lambiris (1996) described four new taxa: *Typhlosaurus aurantiacus bazarutoensis* Broadley, 1990, *T. aurantiacus parietalis* (Broadley, 1990) and *T. aurantiacus carolinensis* Broadley, 1990, both now assigned to *Acontias*, and *A. poecilus* Bourquin and Lambiris, 1996, currently considered a synonym of *A. plumbeus* (Zhao et al. 2019, 2023). Due to its unique morphology and phylogenetic placement in their molecular phylogeny, Daniels et al. (2006) erected the new genus *Microacontias* Daniels, Heideman, Hendricks and Crandall, 2006, to accommodate the members of the *A. lineatus* Peters, 1879 group.

Lamb et al. (2010) provided evidence that *Acontias* and *Typhlosaurus* were the only valid genera of the subfamily Acontinae, synonymising *Acontophiops* and *Microacontias* with *Acontias*, and redistributed the currently known species between *Acontias* and *Typhlosaurus*. Since the revision of Lamb et al. (2010), Wagner et al. (2012) and Conradie et al. (2018) described three additional species of *Acontias*, namely *A. schmitzi* Wagner, Broadley and Bauer, 2012, *A. albigularis* Conradie, Busschau and Edwards, 2018 and *A. wakkerstroomensis* Conradie, Busschau and Edwards, 2018. Currently, *Typhlosaurus* comprises five recognised species (Lamb et al. 2010; Uetz et al. 2023), while the genus *Acontias* has 26 recognised species (Uetz et al. 2023; Zhao et al. 2023). Zhao et al. (2023) found that considerable cryptic diversity exists within the genus *Acontias*, and it is therefore expected that future taxonomic revisions will increase the number of recognised species.

Three *Acontias* species have been recorded from Angola (Marques et al. 2018). With the exception of the extralimital population of *A. percivali* in the Eastern Arc Mountains of north-east Tanzania and south-eastern Kenya, Angola marks the northern and western distributional limit of the genus, which has its main taxonomic diversity and distribution in South Africa (Zhao et al. 2023). No representatives of the genus *Typhlosaurus* have ever been recorded in Angola (Marques et al. 2018), and the genus is currently only known from central Namibia to the Western Cape province of South Africa, chiefly in the Atlantic coastal region (Zhao et al. 2023). The first record of a species of *Acontias* in Angola was provided by Monard (1937) based on three specimens of *A. occidentalis* (originally identified as *A. plumbeus*) collected at Mupa, Cunene province, in September 1933 (Figure 1). Three decades afterwards, Broadley (1968) described *Acontias jappi*, recording it from "Gago Coutinho district" (today Lumbala N'Guimbo), Moxico province (specimen housed in the National Museum of Zimbabwe, Bulawayo, under the accession number NMZB 10116). More recently, *A. kgalagadi* Lamb, Biswas and Bauer, 2010, was recorded in the south-eastern corner of the Cuando-Cubango province, on the border with both Zambia and Namibia (Conradie and Bourquin 2013; Conradie et al. 2016). Interestingly, the occurrence of these species in the country are all based on single collection events.

Figure 1. Specimens of *A. occidentalis* from Mupa, Cunene province (Monard 1937) currently in the collections of the Musée d'Histoire Naturelle de La Chaux de Fonds (MHNC 91.0632 and 91.0633). Note the bleaching of the specimens. The third specimen cited by Monard (1937) could not be located in the MHNC. Photo by Luis MP Ceríaco.

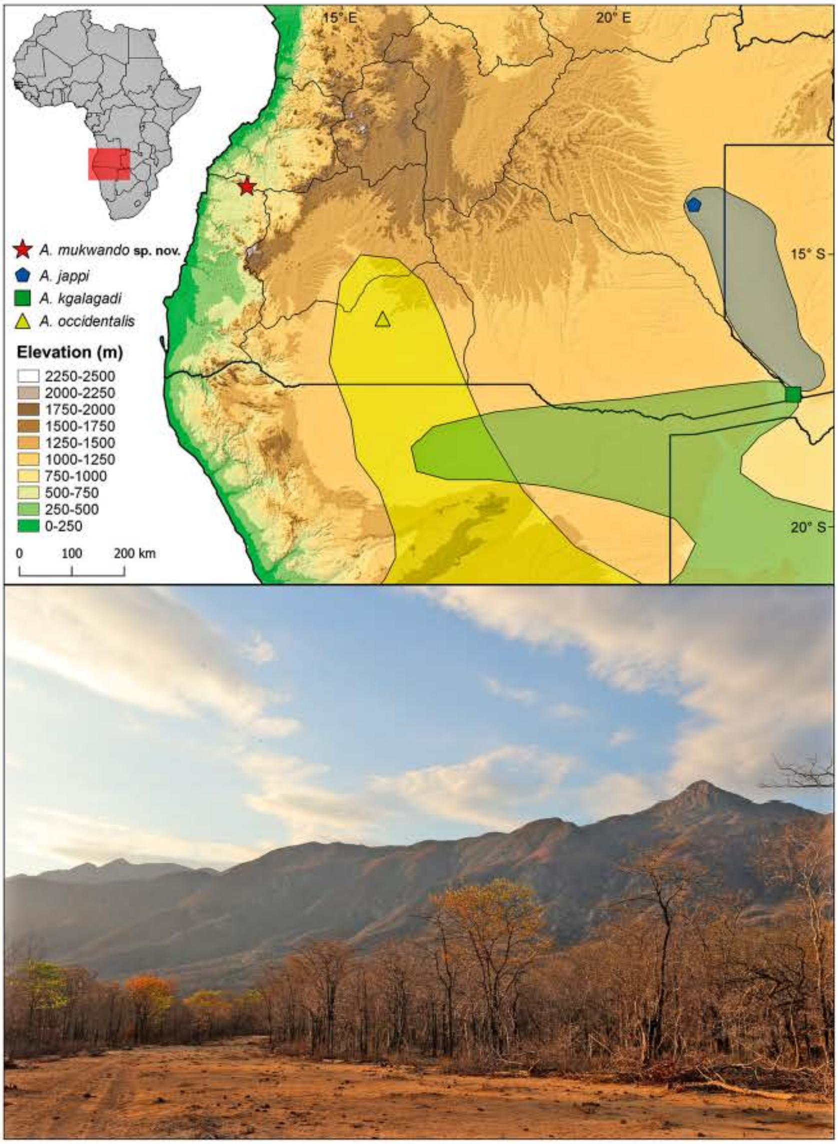

Figure 2. Above: Records of *Acontias* species in Angola and respective distributions in neighbouring areas of Namibia, Zambia and Botswana (data from IUCN). Below: Serra da Neve inselberg from the point of view of surrounding lowlands (Photo by Luis MP Ceríaco).

In the course of recent fieldwork at the Serra da Neve inselberg (Namibe province, south-western Angola; Figure 2) we collected three specimens of a putatively new species of *Acontias* (Figure 3). At first sight, the species is morphologically similar to *A. occidentalis*, but its colouration is different from that recorded for the species across its wide distributional range. Its occurrence at the ecologically isolated inselberg of Serra da Neve (Figure 2) further raises the possibility of it belonging to a different and endemic species. Serra da Neve is an inselberg with a basal area of approximately 630 km^2, located at the northern limit of Namibe province, south-western Angola. It is the

Figure 3. Photo of the live holotype of *Acontias mukwando* **sp. nov.** (MUHNAC/MB03-001522). Photo by Arthur Tiutenko.

second highest peak of Angola, with an elevation of 2 489 m (Pereira 1977) and is covered by a sparse "Miombo" forest habitat, contrasting with the surrounding lowland habitats, which are mainly dominated by Namibian woodland savanna and arid areas of Namib Desert (Grandvaux-Barbosa 1970). Although its biodiversity is still poorly known, and systematic surveys have only recently begun, the inselberg is known to harbour an impressive number of strictly endemic species of amphibians and reptiles, such as *Poyntonophrynus pachnodes* Ceríaco, Marques, Bandeira, Agarwal, Stanley, Heinicke, Blackburn and Bauer, 2018, *Cordylus phonolithos* Marques, Ceríaco, Stanley, Bandeira, Agarwal and Bauer, 2019, *Lygodactylus baptistai* Marques, Ceríaco, Buehler, Bandeira, Janota and Bauer, 2020, and *Afroedura praedicta* Branch, Schmitz, Lobón-Rovira, Baptista, António and Conradie, 2021 (Ceríaco et al. 2018; Marques et al. 2019, 2020; Branch et al. 2021).

Based on a combination of morphological, meristic, and colouration characters and DNA sequence data, we found evidence that supports the specific recognition of the Serra da Neve population and describe it herein.

Materials and methods

Newly collected specimens for this study were euthanised with MS-222 following standard practices (Simmons 2015), fixed in 10% buffered formalin in the field, and transferred to 70% ethanol for long-term storage at the conclusion of fieldwork. Liver tissue was removed before formalin fixation and preserved in 95% ethanol for long-term storage. The newly collected specimens were deposited in the collections of the Museu Nacional de História Natural e da Ciência, Universidade de Lisboa (MUHNAC), Lisbon, Portugal. For mensural and meristic comparisons, we examined the few existing Angolan *Acontias* specimens deposited in the collections of the Musée d'Histoire Naturelle de La Chaux de Fonds (MHNC), in La Chaux de Fonds, Switzerland, and the Natural History Museum of Zimbabwe (NMZB) in Bulawayo, Zimbabwe.

Phylogenetic methods

Tissue samples from all three specimens were used for DNA extraction, sequencing and subsequent phylogenetic analyses. Genomic DNA was extracted using Spin Column Animal Genomic DNA Miniprep Kit from Biobasic (Markham, Ontario, Canada), following the manufacturer's instructions. Specimens were sequenced for the mitochondrial 16S rRNA and the nuclear Recombination Activating Protein 1 (RAG1) genes, and amplified using mitochondrial 16S rRNA and the nuclear Recombination Activating Protein 1 (RAG1) genes. Successful amplifications were enzymatically purified and then sequenced following the BigDye Terminator v3.1 Cycle sequencing protocol (Applied Biosystems, Waltham, MA, USA) using an automated Sequencer ABI3500xl Genetic Analyzer at the Centre for Molecular Analysis (CTM) in the Research Centre in Biodiversity and Genetic Resources (CIBIO), Vairão, Portugal. Two datasets (16S and RAG1) were constructed using MAFFT software (version 7.304, Katoh and Standley 2013) which included the three newly sequenced individuals (see Table 1 for GenBank Accession numbers) and all previously available sequences of the same genes from Zhao et al. (2023). The 16S and RAG1 datasets were then concatenated into a RAG1 + 16S dataset with 1 595 nucleotides (nt) (RAG1 = 1 100 nt; 16S = 495 nt) for phylogenetic analyses. Outgroups were the same as used by Zhao et al. (2023). DAMBE 7 (Xia 2018) was used to test each partition for substitution saturation following the method of Xia et al. (2003) and found little saturation even under the assumption of an asymmetric tree ($P < 0.001$). Incongruence Length Difference (ILD) tests were used to investigate incongruence between the two concatenated genes (Farris et al. 1994) and showed no significant phylogenetic conflict between the RAG1 and 16S ($p = 0.95$).

Phylogenies were estimated using Maximum Likelihood (ML) and Bayesian Inference (BI) methods in IQ-TREE v. 2.2.0 (Minh et al. 2020) and Mr Bayes v. 3.2.7a (Ronquist et al. 2012), respectively. The best-fitting nucleotide substitution models under the corrected Akaike Information Criterion were selected using JModelTest 2.1.10 (Darriba et al. 2012) for each partition of the subsequent analyses. The dataset was partitioned by gene and ran using the GTR + I + G model per partition. BI analyses were initiated with program-generated trees and four Markov chains with default incremental heating. Two independent runs of 10×10^6 generations were sampled at 1 000 generation intervals, generating a total of 10 000 trees. 10% Burn-in was determined by convergence of log-likelihood and parameter values using Tracer v. 1.7.1 (Rambaut et al. 2018). For ML,

Table 1. GenBank data for *Acontias mukwando* **sp. nov.**

	Catalogue No.	GenBank	Field No.
16s	MUNHAC/MB03-001522	OR461470	LMPC 3172
	MUNHAC/MB03-001524	OR461471	LMPC 3251
	MUNHAC/MB03-001523	OR461472	LMPC 3276
RAG1	MUNHAC/MB03-001522	OR461215	LMPC 3172
	MUNHAC/MB03-001524	OR461216	LMPC 3251
	MUNHAC/MB03-001523	OR461217	LMPC 3276

phylogenetic analyses were performed with an initial tree search, followed by 10 independent runs and 10 000 ultrafast bootstrap replicates.

Morphological methods

Specimens were measured with a digital calliper to the nearest 0.1 mm. Lepidosis was examined under a stereomicroscope. Scale nomenclature, scale counts, and measurements used in the description follow Broadley and Greer (1969), Wagner et al. (2012) and Conradie et al. (2018). We took the following measurements and scale counts: snout-vent length (**SVL**), from tip of snout to vent; tail-length (**TL**), from the cloacal opening to the tip of the tail; head-length (**HL**), measured from the angle of the jaw to the tip of the snout; head-width (**HW**), measured at widest position; midbody scale rows (**MSR**); anterior scale rows (**ASR**), counted a head´s length behind the head; and posterior scale rows (**PSR**), counted just before the cloaca; the number of ventral scales (**VS**), from the chin shields (excluded) to the cloacal scale (also excluded); and subcaudals (**SC**), from the cloaca (excluded) to the tip of the tail. Head scales and their arrangement was also recorded, following the nomenclature established by Broadley and Greer (1969). Finally, the colouration pattern was reported, and high-resolution photographs of the specimens were taken when they were alive and preserved. These data were compared with relevant literature on the group (FitzSimons 1941, 1943; Broadley 1968; Broadley and Greer 1969; Branch 1998; Lamb et al. 2010; Wagner et al. 2012; Conradie et al. 2018; Pietersen et al. 2021). To compare the colouration patterns of the different species across their known distributions, we also examined the research grade records [records confirmed by a consensus of experts] of the genus *Acontias* published on the online citizen science platform iNaturalist (www.inaturalist.org; GBIF 2023).

Results

The phylogeny (Figure 4) recovers the main groups and interrelationships of species as presented by Zhao et al. (2023). The Serra da Neve population is closely related to the clade containing *A. percivali* and *A. occidentalis* Clade 4 *sensu* Zhao et al. (2023) with 75% bootstrap support. The genetic distinctiveness of the Serra da Neve population is in agreement with that between other species pairs in the genus. The uncorrected mean 16S sequence differences between the Serra da Neve population and its most closely related lineages, *A. percivali* and *A. occidentalis* Clade 4, are 3.64% and 2.85%, respectively. In comparison, the uncorrected mean 16S distance between the different species of the genus ranges between 1.38 and 11.34% (Zhao et al. 2023).

Morphological and colouration data also allow the Serra da Neve population to be distinguished from all congeners (see account below). Therefore, adopting de Queiroz's (1999) general lineage species concept, we here describe the Serra da Neve *Acontias* as a new species.

Systematics

(Squamata: Scincidae: Acontinae)

Acontias mukwando **sp. nov.**

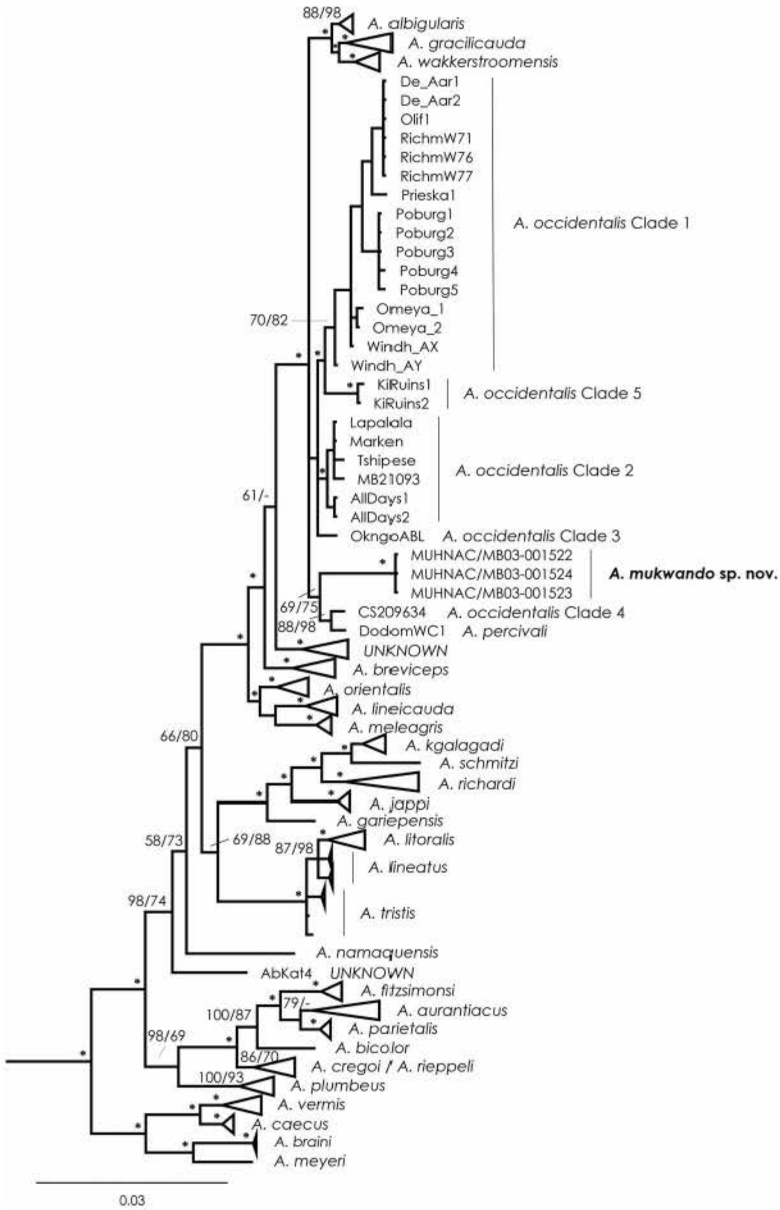

Figure 4. Bayesian Inference (BI) phylogenetic tree inferred from the concatenated RAG1 and 16S dataset. Support values above the branches are per cent posterior probabilities/ultrafast bootstraps. Support values > 0.95 for both phylogenetic analyses are indicated by an asterisk, support values < 0.5 and those in very shallow branches have been deleted for clarity. *Acontias occidentalis* clades correspond to those in Zhao et al. (2023). Outgroup not shown for figure clarity.

Holotype: An unsexed adult (MUHNAC/MB03-001522, field no. LMPC 3172; Figures 5, 7, 8), collected in the vicinity of Catchi, Serra da Neve inselberg [-13.7660°, 13.2587°, 1674 m a.s.l.], Namibe province, Angola, by Diogo Parrinha, Mariana Marques, and Luis M.P. Ceríaco on 28 October 2022.

Figure 5. Lateral, dorsal and ventral views of the holotype (MUHNAC/MB03-001522) of *Acontias mukwando* **sp. nov.** in life. Photos by Arthur Tiutenko.

Paratypes: Two specimens: An unsexed juvenile (MUHNAC/MB03-001524, field no. LMPC 3251; Figures 6, 7) and an unsexed adult (MUHNAC/MB03-001523, field no. LMPC 3276; Figure 7), with the same collecting data of the holotype, but collected, respectively, on 1 and 2 November 2022.

Diagnosis: A medium-sized limbless species of the genus *Acontias* (Figures 3, 5–7), with movable eyelids, no ear opening, and a clear scale covering the pineal foramen. It is distinguished from all other species of the genus by the combination of the eye being exposed, three chin shields bordering the mental, 15–18 MSR, 172–178 VS, and a colour pattern characterised by a dark dorsum and cream flanks and ventrum. The dark dorsal pigmentation is reduced to the middorsal region, and the cream-coloured lateral colouration continues dorsally, forming an interrupted collar across the nape.

Acontias mukwando **sp. nov.** can be distinguished from the two other Angolan congeners, *A. jappi* and *A. kgalagadi*, in possessing moveable eyelids (absent in *A. jappi* and *A. kgalagadi*). The possession of moveable eyelids also allows its immediate distinction from other congeners not yet recorded for the country, but which occur in neighbouring areas

Figure 6. Live photo of the juvenile paratype (MUHNAC/MB03-001524). Photo by Arthur Tiutenko.

of Zambia, such as *A. schmitzi*. Regarding the other species of *Acontias* recorded in Angola — *A. occidentalis* — *Acontias mukwando* **sp. nov.** is distinguished mostly on the grounds of colouration. Monard (1937) noted that the three specimens of *A. occidentalis* collected in Mupa were "dark grey, barely browner on the ventral surfaces, the rostral and mental lighter". The two extant specimens housed in the MHNC (MHNC 91.0632 and MHNC 91.0633) are mostly bleached, but their colour is uniform and does not suggest any kind of pattern as seen in the type series of *Acontias mukwando* **sp. nov.** *Acontias occidentalis* is known for having different colour morphs (Broadley and Greer 1969), which might correspond to the recently identified cryptic lineages found by Zhao et al. (2023).

Figure 7. Preserved type series of *Acontias mukwando* **sp. nov.** Photos by Luis M.P. Ceríaco.

Specimens from the Kalahari region and around the type locality of the nominotypical form (Okahandja, central Namibia), are black above and below, sometimes with up to 35 scattered white ventral scales (Broadley and Greer 1969). This pattern is similar to that reported by Monard (1937) for the specimens from Mupa and is in line with the existing records from central Namibia available on GBIF (2023). A second colour morph corresponds to what was originally described by FitzSimons (1956) as *A. plumbeus broadleyi* [considered as a colour morph of *A. occidentalis* by Broadley and Greer (1969)], that mostly occurs in non-Kalahari sands areas, such as Zimbabwe and parts of South Africa, and is olive green or grey-brown above (pigmentation diffuse) and white below (Broadley and Greer 1969). However, as Broadley and Greer (1969) note, these two morphs occur sympatrically across the range of *A. occidentalis*. Neither of these two morphs corresponds to the very unique colouration pattern of *A. mukwando* **sp. nov.**, which is homogeneous cream ventrally and laterally and dark brown on the dorsum with the exception of the neck region. *Acontias mukwando* **sp. nov.** is also readily distinguished from its other phylogenetically closely related species, *A. percivali*, by its distinctive interrupted collar (versus continuous dark colouration on the nape). *Acontias mukwando* **sp. nov.** and *A. percivali* populations are also separated by a minimum distance of 2 600 km.

Similarly, the new species can also be distinguished from *A. plumbeus* by its colouration (homogeneous cream on the ventrum and flanks, dark brown on the dorsum with the exception of the neck region in *A. mukwando* **sp. nov.** versus uniform black or brown in *A. plumbeus*). It can also be distinguished from this species by a higher number of ventral scales (172–178 versus 146–165 in *A. plumbeus*) and by its much smaller size (maximum SVL 153 mm in *A. mukwando* **sp. nov.** versus 490 mm in *A. plumbeus*). It can also be distinguished from *A. breviceps* by a higher number of ventral scales (172–178 versus 149–165 in *A. breviceps*). It can be distinguished from *A. aurantiacus aurantiacus*, *A. aurantiacus bazarutoensis*, *A. aurantiacus carolinensis*, *A. fitzsimonsi*, *A. parietalis* and *A. poecilus* (currently considered a synonym of *A. plumbeus* according to Zhao et al. 2019) by having only three chin shields bordering the mental (versus 5). It can be distinguished from *A. rieppeli* and *A. richardi* by having four supraciliaries (versus only two in *A. rieppeli* and one in *A. richardi*). Comparing the newly described species with other members of the genus such as *A. cregoi*, *A. bicolor*, *A. kgalagadi* and *A. gariepensis*, it can be easily distinguished by possessing moveable eyelids; regarding *A. albigularis*, *A. gracilicauda*, *A. meleagris* complex, *A. namaquensis*, *A. lineacauda*, *A. litoralis*, *A. grayi*, *A. tristis*, *A. lineatus* and *A. wakkerstroomensis,* it can be distinguished by having 24–30 SC (versus > 31 in the cited taxa).

Description of Holotype: A medium-sized *Acontias* species with a total length of 172.2 mm (152 mm SVL; 20.2 mm TL). Body cylindrical. Head short (6.3% of the SVL) and narrow (HW 5.8 mm). Snout rounded and very short. Large rostral with the nostril pierced in the anterior part, connected with the border of the rostral by a straight, narrow suture. Two supraoculars, first much larger than the second. Four supracilliaries, all about the same size. Five supralabials, the second largest, all well excluded from the eye by the preocular and three suboculars. Three infralabials, the first higher than long, the second quadrangular, and the third longer than high. Loreal large, in contact with the first supralabial, prefrontal, rostral and preocular. Dorsally, the rostral is followed by two enlarged head scales (prefrontal and frontal). Prefrontal large and subrectangular in shape, frontal more or less hexagonal, larger than the prefrontal and bordered posteriorly by two large parietal scales separated by an interparietal. Parietal scales in contact posteriorly and subrectangular. Two narrow longitudinal scales bordering the two parietal scales. The pineal eye is pierced in the central part of the interparietal scale. Mental large, bordered posteriorly by three chin shields and one lower labial on each side of the head (Figure 8). Body scales smooth, in 15 rows at midbody (18 ASR, 15 MSR, 14 PSR), 174 ventral scales, and 24 subcaudal scales. The first four subcaudal scales are divided, after which undivided scales extend to the tail tip. Dorsal part of the head dark brown, but rostral cream. The same dark-brown colouration extends homogeneously across the dorsum and dorsal part of the tail, however, in the neck region it is restricted to the mid-dorsal area. Laterally and ventrally homogeneously cream. An incomplete pale collar is present on the nape.

Variation: Variation in scalation and body measurements of the type series is reported in Table 2. Paratype MUNHAC/MB03-001523 is very similar to the holotype, however, contrary to the holotype, the paratype presents three supraoculars. This condition is also

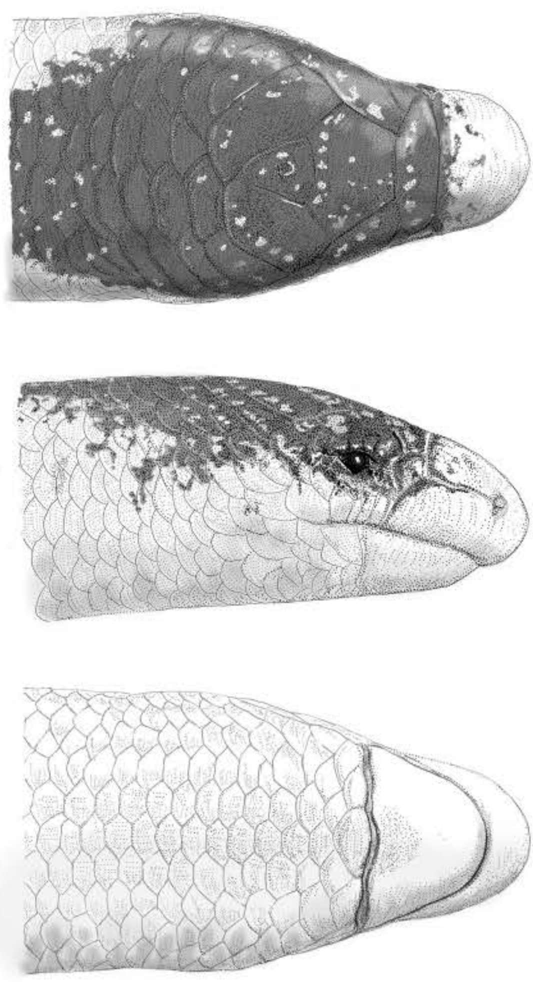

Figure 8. Head scalation of the holotype (MUHNAC/MB03-001522). Drawings by Arthur Tiutenko.

Table 2. Mensural (in mm) and meristic counts of the holotype and paratypes of *Acontias mukwando* **sp. nov.** SVL, snout-vent length; TL, tail-length; HL, head-length; HW, head-width; ASR, anterior scale rows; MSR, midbody scale rows; PSR, posterior scale rows; VS, ventral scales; SC, subcaudals.

	MUNHAC/MB03-001522	MUNHAC/MB03-001523	MUNHAC/MB03-001524
	Holotype	Paratype	Paratype
SVL	152	150	100
TL	20.2	20	14.2
HL	10.8	10.4	8.7
HW	5.8	5.6	4.5
ASR	18	18	18
MSR	15	16	18
PSR	14	14	14
VS	174	172	178
SC	24	30	29

shared with the juvenile paratype MUNHAC/MB03-MB03-001524. The paratypes agree almost entirely with the holotype with respect to colouration. While the holotype displays diffuse cream stippling over the dark dorsal pattern, paratype MUNHAC/MB03-MB03-001524 shows a lesser degree of stippling and the juvenile paratype MUNHAC/MB03-MB03-001524 has a solid dorsal pattern.

Distribution: The species is currently only known from the Serra da Neve inselberg, Namibe province, south-western Angola (Figure 2). Given the isolation of the inselberg and the stark contrast with its surrounding habitat, the newly described species is assumed to be endemic to Serra da Neve.

Habitat and natural history notes: The holotype was found under a granite rock, while the paratypes were found foraging on leaf litter during the morning. The habitat in the area is dominated by Miombo (*Brachystegia*) forest and the ground is mostly covered with leaf litter from these trees (Figure 9).

Etymology: The specific epithet "*mukwando*" is a noun in apposition and is given in honour of the people that inhabit Serra da Neve. This name is a recognition of the support, enthusiasm and friendship shown by the Catchi villagers to our team. We suggest "Serra da Neve lance-skink" and "Lagarto-lança-da-Serra da Neve" as the English and Portuguese common names, respectively, for this species.

Conservation: The current known distribution of the species indicates that it is endemic to Serra da Neve, an area already signalled as of conservation interest by the Angolan

Figure 9. Typical habitat of *Acontias mukwando* **sp. nov.** at Serra da Neve, Angola. Photo by Diogo Parrinha.

Figure 10. Above: Domestic cattle from the Mukwando community in Serra da Neve. Photo by Luis MP Ceríaco. Below: Land use by the Mukwando community in the vicinity of Catchi. Photo by Arthur Tiutenko.

authorities, but so far not formally designated as a conservation area. Using the GeoCAT Geospatial conservation assessment tool (Bachman et al. 2011), we estimated an extent of occurrence of around 630 km^2 for *Acontias mukwando* **sp. nov.**, assuming that the species occurs homogeneously on the inselberg. The area is inhabited by a local human population and its associated domestic animals, such as dogs and cattle (Figure 10). Other land uses can also be a threat to the species, such as agriculture and slash-and-burn agriculture, both of which we observed in parts of Serra da Neve (Figure 10). Nevertheless, the currently available data does not allow us to assess its conservation status unambiguously and, therefore, we suggest that a Data Deficient status (DD) is warranted for this species (IUCN Standards and Petitions Committee 2019). A formal IUCN Red List assessment is, however, necessary to confirm this.

Discussion

Zhao et al. (2023) found that *A. occidentalis* is composed of at least five cryptic lineages that may warrant species-level recognition. The specimen from Mupa, south-western Angola, collected by Monard (1937), may correspond to Clade 3 of Zhao et al. (2023), while the nominotypical form most likely corresponds to their Clade 1, considering its geographic distribution. Biogeographically, the relationship between *Acontias mukwando* **sp. nov.** and the other members of the *A. occidentalis* species complex (including *A. percivali*) reflects patterns already found for other endemic species from Serra da Neve, such as *Lygodactylus baptistai* (see Marques et al. 2020), in which the inselberg taxa present closer phylogenetic affinities to the taxa occurring in the highlands of East Africa, instead of species occurring in the surrounding lowlands of the Namib Desert. The high species richness of *Acontias*, as of other small and limbless species, can be explained by its low vagility and response to paleoclimatic events and aridification (Zhao et al. 2023). Due to its isolation and geographic features, Serra da Neve represents a true island of vegetation isolated by a surrounding arid area.

Serra da Neve is undoubtedly a biodiversity hotspot in Angola. In the past five years, five endemic herpetological taxa have been described from the inselberg, with at least another one being currently described (Parrinha et al. unpublished data). Besides the endemic taxa, the inselberg hosts a series of other regional endemics such as *Trachylepis* *huilensis* (Laurent, 1964), *Heliobolus crawfordi* Marques, Ceríaco, Heinicke, Chebouri, Conradie, Tolley and Bauer, 2022 and *Pachydactylus maiatoi* Marques, Parrinha, Ceríaco, Brennan, Heinicke and Bauer, 2023 (Laurent 1964; Marques et al. 2022, 2023; Marques et al. unpublished data), reinforcing the taxonomic uniqueness of Serra da Neve, but also its conservation importance. On a per area basis, Serra da Neve is undoubtedly the richest region in the country with respect to strict endemics, with a total of one endemic herpetological taxon per 100 km^2 (Marques unpub. data), a value similar to or higher than those found in endemic-rich oceanic islands such as the Gulf of Guinea Oceanic Islands (Bell et al. 2022; Ceríaco et al. 2022). These numbers are surely not definitive as Serra da Neve remains one of the least explored areas in Angola and most of the surveys have been largely focused on amphibians and reptiles. However, recent multidisciplinary surveys have also uncovered interesting and cryptic diversity within other taxonomic groups which will result in a better understanding of the taxonomic diversity, biogeographic patterns and endemicity score of Serra da Neve.

Acknowledgements

The present work is a result of the ongoing collaboration between the Instituto Nacional de Biodiversidade e Áreas de Conservação (INBAC) from the Ministry of Environment of Angola and its international partners. Angolan specimens were collected and exported under permits issued by INBAC (65/INBAC.MINAMB/2022). We also thank the provincial and local authorities for their support and cooperation during our fieldwork. We thank Adam Ferguson, Ben Marks and Daryl Coldren for their support during fieldwork. Special thanks to Álvaro (Varito) Baptista and his team from Omahua Lodge, for all the assistance, great support, and friendship during the fieldwork. Luis Querido and João Serôdio de Almeida provided critical support for the success of this expedition. Werner Conradie, Harith Farooq and an anonymous reviewer are thanked for their important suggestions on the improvement of the manuscript.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was funded by the National Geographic Society Explorer Grant (NGS-73084R-20) to LMPC. DP is supported by Fundação para a Ciência e Tecnologia (FCT) grant (2021.05238.BD). MPM was supported by FCT grants (SFRH/BD/129924/2017, COVID/BD/152155/2022). Work co-funded by the project NORTE-01-0246-FEDER-000063, supported by Norte Portugal Regional Operational Programme (NORTE2020), under the PORTUGAL 2020 Partnership Agreement, through the European Regional Development Fund (ERDF). AMB was supported by grant DEB 2146654 from the US National Science Foundation.

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