



First Record of an Amphisbaenian, a Kalahari Dwarf Wormlizard, *Zygaspis quadrifrons*, as Prey of Sundevall’s Writhing Skink, *Mochlus sundevallii* (Squamata: Scincidae)

Henrique C. Costa¹, Joshua Mata², and Luis M.P. Ceríaco³

¹Departamento de Biologia Animal, Universidade Federal de Viçosa, 36570-900, Viçosa, Minas Gerais, Brazil (current address: Departamento de Zoologia, Universidade Federal de Juiz de Fora, 36036-900, Juiz de Fora, Minas Gerais, Brazil) (ccostah@gmail.com)

²Amphibian and Reptile Collection, The Field Museum, 1400 S. Lake Shore Drive, Chicago, Illinois 60605, USA

³Museu de História Natural e da Ciência da Universidade do Porto, Praça Gomes Teixeira, 4099-002 Porto, Portugal, and Departamento de Zoologia e Antropologia (Museu Bocage), Museu Nacional de História Natural e da Ciência, Universidade de Lisboa, Rua da Escola Politécnica, 58, 1269–102 Lisboa, Portugal

Sundevall’s Writhing Skink, *Mochlus sundevallii* (Smith 1849), is a common fossorial species that is widely distributed in southern Africa (Freitas et al. 2018), where it is associated with arid sandy habitats (Branch 1998; Bates et al. 2014). This species was long thought to be a species complex containing two different taxa, *M. sundevallii* and *M. afer* (Peters 1854) (Broadley 1966). However, a recent integrative study combining phylogenetic and molecular data indicated that, despite some genetic differences between populations across its extensive distribution, no evidence supported the existence of two taxa, rendering *M. afer* a junior synonym of *M. sundevallii* (Freitas et al. 2018).

Despite its abundance and wide distribution (Bates et al. 2014; Freitas et al. 2018), little is known about the diet of *M. sundevallii*. The few data available suggest that the species feeds mainly on small invertebrates, such as ants, termites, beetles, spiders and spider eggs, grasshoppers, crickets, cockroaches, soft snails, caterpillars, and insect larvae, and myriapods (Schmidt 1919; Fitzsimons 1943; Rose 1962; Auerbach 1987; Branch 1998; Spawls et al. 2004, 2018).

In 2019, when one of us (HCC) was examining amphisbaenians at the Field Museum (FMNH) in Chicago, Illinois, USA, we noticed that the remains previously retrieved from stomach contents of a *M. sundevallii* (FMNH 142804, cur-

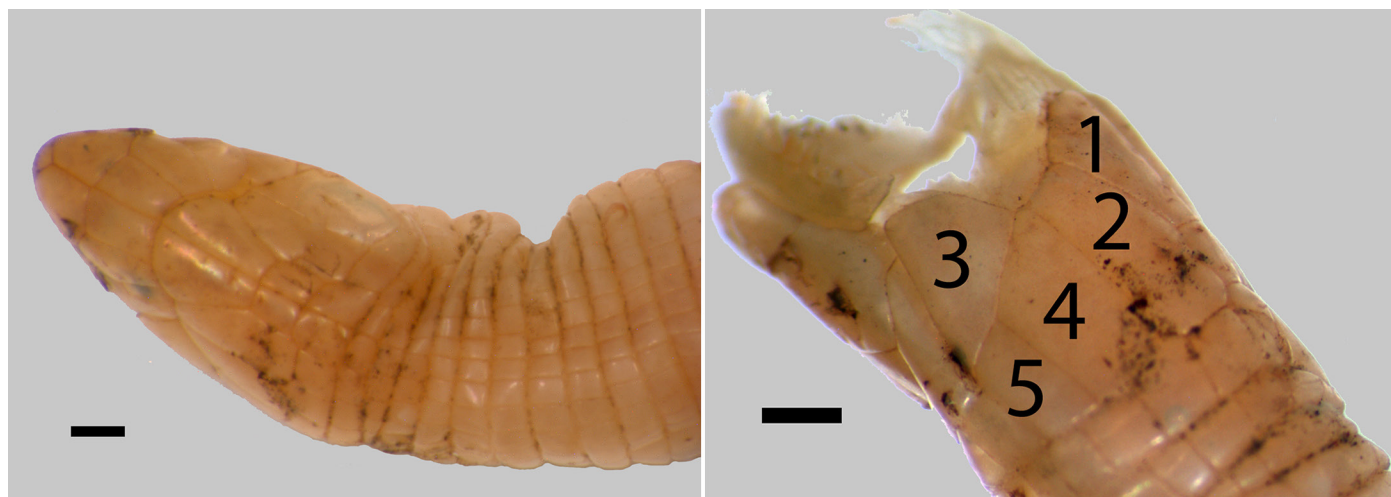


Fig. 1. Dorsal (left) and dorsolateral (right) views of the remains of Kalahari Dwarf Wormlizard (*Zygaspis quadrifrons*) (FMNH 161703) recovered from the stomach of a Sundevall’s Writhing Skink (*Mochlus sundevallii*) (FMNH 142804); the handling of the poorly preserved specimen caused the front half of the head to detach while taking the second picture. Numbered head scales are frontal (1), postocular (2), third supralabial (3), temporal (4), and post-supralabial (5). Scale bars = 1 mm.

rently cleared and stained), collected by Richard Japp in September 1964 at Kalabo, Western Province, Zambia (former Barotseland, Northern Rhodesia) (14.9911°S, 22.6788°E; elev. 1,029 m asl), were in fact the head and part of the trunk of a wormlizard of the genus *Zygaspis* Cope 1885 (FMNH 161703).

Wormlizards in the genus *Zygaspis* range from the Democratic Republic of Congo to South Africa (Measey and Tolley 2013). Eight species are currently recognized (Broadley and Measey 2016), but only *Z. nigra* Broadley and Gans 1969 and *Z. quadrifrons* (Peters 1862) have been recorded in western Zambia, including the region around Kalabo (Broadley and Broadley 1997). These species can be distinguished morphologically by the presence of a large temporal (resulting from the fusion of temporals and postsupralabials) in *Z. nigra*, versus the presence of one or two temporals plus a postsupralabial in *Z. quadrifrons* (Broadley and Broadley 1997).

We identified the prey as *Z. quadrifrons*, the most widely distributed species of *Zygaspis*, which has been recorded in the Democratic Republic of Congo, Angola, Zambia, Zimbabwe, Namibia, Botswana, and South Africa (Broadley and Broadley 1997). Like *M. sundevalli*, *Z. quadrifrons* is commonly found in sandy soils (Branch 1998). Besides occurring in similar types of habitats, both *M. sundevalli* and *Z. quadrifrons* are frequently found near termite nests, where they feed on termites (Branch 1998; Largen and Spawls 2010; LMPC, pers. obs.), increasing the chance of encounters. Observations of fossorial species like amphisbaenians in the wild are mostly anecdotal, and predation events usually are recorded after heavy rains (Hayes et al. 2015; Tanaka et al. 2019), soil removal (West 1975; Zamprogno and Sazima 1993; Assis and Costa 2020), or by the examination of stomach contents of predators in scientific collections (Marques and Sazima 1997; Shine et al. 2006; Maschio et al. 2010). The predation event we present herein, reported almost six decades after the specimen's collection, is, to the best of our knowledge, the first report of a wormlizard in the diet of *M. sundevalli* and another testament to the value of museum collections for a better understanding of natural history.

Acknowledgements

HCC thanks the Field Museum (Chicago) and the American Museum of Natural History (New York) for collection study grants, and Programa Nacional de Pós-Doutorado, Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (PNPD/CAPES) for a postdoctoral scholarship (2018–2019).

Literature Cited

- Assis, C.L. and H.C. Costa. 2020. *Leposternon octostegum*: New record of an endangered worm lizard species, with comments on habitat and opportunistic predators (Squamata: Amphisbaenia). *Herpetologia Brasileira* 9: 109–120.
- Auerbach, R.D. 1987. *The Amphibians and Reptiles of Botswana*. Mokwepa Consultants, Botswana.
- Bates, M.F., W.R. Branch, A.M. Bauer, M. Burger, J. Marais, G.J. Alexander, and M.S. de Villiers. 2014. *Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland*. South African National Biodiversity Institute, Pretoria, South Africa.
- Branch, W.R. 1998. *Field Guide to Snakes and other Reptiles of Southern Africa*. Ralph Curtis Publishing, Fort Myers, Florida, USA.
- Broadley, D.G. 1966. A review of the *Riopa sundevalli* group (Sauria: Scincidae) in southern Africa. *Arnoldia (Rhodesia) Series* 2(34): 1–7.
- Broadley, D.G., and S. Broadley. 1997. A revision of the African genus *Zygaspis* Cope (Reptilia: Amphisbaenia). *Syntarsus* 4: 1–24.
- Broadley, D.G., and G.J. Measey. 2016. A new species of *Zygaspis* (Reptilia: Squamata: Amphisbaenidae) from north-eastern Mozambique. *African Journal of Herpetology* 65: 115–122. <https://dx.doi.org/10.1080/21564574.2016.1183717>.
- Fitzsimons, V.F. 1943. The lizards of south Africa. *Transvaal Museum Memoir* 1: 1–528.
- Freitas, E.S., A.M. Bauer, C.D. Siler, D.G. Broadley, and T.R. Jackman. 2018. Phylogenetic and morphological investigation of the *Mochlus afer-sundevalli* species complex (Squamata: Scincidae) across the arid corridor of sub-Saharan Africa. *Molecular Phylogenetics and Evolution* 127: 280–287. <https://dx.doi.org/10.1016/j.ympev.2018.04.020>.
- Hayes, F.E., P. Capllonch, and R. Montero. 2015. Predation on *Amphisbaena heterozonata* by the Whistling Heron *Syrigma sibilatrix* at Tucumán, Argentina. *Revista Brasileira de Ornitologia* 23: 395–397. <https://doi.org/10.1007/BF03544315>.
- Largen, M. and S. Spawls. 2010. *The Amphibians and Reptiles of Ethiopia and Eritrea*. Edition Chimaira, Frankfurt am Main, Germany.
- Marques, O.A.V., and I. Sazima. 1997. Diet and feeding behavior of the coral snake *Micrurus corallinus*, from the Atlantic Forest of Brazil. *Herpetological Natural History* 5: 88–93.
- Maschio, G.F., A.L.C. Prudente, F.S. Rodrigues, and M.S. Hoogmoed. 2010. Food habits of *Anilius scytale* (Serpentes: Aniliidae) in the Brazilian Amazonia. *Zoologia* 27: 184–190. <https://dx.doi.org/10.1590/S1984-46702010000200005>.
- Measey, G.J., and K.A. Tolley. 2013. A molecular phylogeny for sub-Saharan amphisbaenians. *African Journal of Herpetology* 62: 100–108. <https://dx.doi.org/10.1080/21564574.2013.824927>.
- Rose, W. 1962. *The Reptiles & Amphibians of Southern Africa*. Maskew Miller, Pretoria, Gauteng, South Africa.
- Schmidt, K.P. 1919. Contributions to the herpetology of the Belgian Congo based on the collection of the American Museum Congo Expedition, 1909–1915. Part I, Turtles, crocodiles, lizards and chameleons. *Bulletin of the American Museum of Natural History* 39: 385–624.
- Shine, R., W.R. Branch, P.S. Harlow, J.K. Webb, and T. Shine. 2006. Biology of Burrowing Asps (Atractaspididae) from southern Africa. *Copeia* 2006: 103–115. [https://dx.doi.org/10.1643/0045-8511\(2006\)006\[0103:BOBAAF\]2.0.CO;2](https://dx.doi.org/10.1643/0045-8511(2006)006[0103:BOBAAF]2.0.CO;2).
- Spawls, S., K. Howell, R. Drewes, and J. Ashe. 2004. *A Field Guide to the Reptiles of East Africa*. Bloomsbury Publishing, London, UK.
- Spawls, S., K. Howell, H. Hinkel, and M. Menegon. 2018. *Field Guide to East African Reptiles*. Bloomsbury Publishing, London, UK.
- Tanaka, R.M., E. Muscat, and D.R. Stuginski. 2019. White-necked hawk (*Amadonastus lacernulatus*) feeding on Amphisbaenidae. *Ornitologia Neotropical* 30: 256–259.
- West, S. 1975. Gray Hawk feeding on worm lizard. *Condor* 77: 354.
- Zamprogno, C. and I. Sazima. 1993. Vertebrate predation on the Neotropical amphisbaenian *Leposternon wuchereri*. *Herpetological Review* 24: 82–83.