

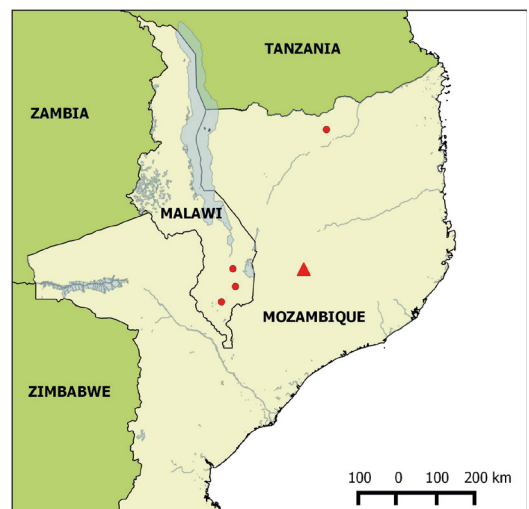
## A second record of *Scolecormorphus kirkii* Boulenger, 1883 (Gymnophiona: Scolecormorphidae) for Mozambique

Harith Omar Morgadinho Farooq<sup>1</sup> and Werner Conradie<sup>2,\*</sup>

The herpetofauna of northern Mozambique (Nampula, Niassa, and Cabo Delgado Provinces) remains one of the most poorly-known in Africa. This is a consequence of the physical inaccessibility of the region as well as the protracted civil war, which affected the study of many areas. Mozambique is expected to have a large diversity of herpetofauna due to the variety of different habitat types available and the large size (area) of the country. The lack of scientific studies of northern Mozambique has led to widely disparate and inaccurate summaries of the herpetofaunal diversity of the country. While there are no formal publications that explicitly deal with this topic, reputable internet sources indicate that 221 reptile (Uetz, 2015) and 69 amphibian species (AmphibiaWeb, 2015) are expected to occur in the whole of Mozambique. This is no doubt an underestimation of the actual diversity due to under-sampling in many of the remote areas of Mozambique, especially the northern parts of the country. Recent years have seen a series of small expeditions launched to northern Mozambique, e.g. Niassa Game Reserve (Branch et al., 2005; Branch, 2004), the coastal dry forests in Cabo Delgado Province (Pascal, 2011), and the Kew/Darwin Initiative to catalogue the ‘inselberg’ biodiversity (Bayliss et al., 2012; Bayliss et al., 2010; Timberlake et al., 2012; Timberlake et al., 2009; Timberlake et al., 2007). These expeditions resulted in the discovery of several new species of reptiles (Branch and Bayliss, 2009; Branch and Tolley, 2011; Portik et al., 2013b;

Branch et al., 2014), crustaceans (Daniels and Bayliss, 2012) and bats (Taylor et al., 2012). While Portik et al. (2013a) summarised the herpetofauna of the inselbergs of northern Mozambique, they overlooked the valuable amphibian collections in the technical report by Branch (2004) from Niassa Game Reserve and the herpetofaunal collections from Mount Mabu (Timberlake et al., 2012), which led to underestimation and incorrect accounts of the herpetofaunal diversity of the montane inselbergs of northern Mozambique.

In November 2011 and May 2014 a team of scientists, mountain climbers, and conservationists had the opportunity to survey Mount Namuli, which resulted in some additions to the herpetofauna of that area.



**Figure 1.** *Scolecormorphus kirkii* records for Malawi and Mozambique. Triangle represents the new record from Mount Namuli.

<sup>1</sup> Faculty of Natural Sciences, Lúrio University, Caixa Postal 958, Pemba, Mozambique.

<sup>2</sup> Port Elizabeth Museum (Bayworld), P.O. Box 13147, Humewood 6013, South Africa.

\* Corresponding author e-mail: werner@bayworld.co.za



**Figure 2.** Full body image of *Scolecomorphus kirkii* from Mount Namuli, Nampula Province, Mozambique.



**Figure 3.** Close-up of the head of *Scolecomorphus kirkii* from Mount Namuli, Nampula Province, Mozambique.

Visual encounter survey methods were used to conduct the herpetofaunal surveys of the study area. Diurnal searches were done by actively searching specific microhabitats including underneath rocks and decaying logs. Nocturnal surveys were also carried out with the use of headlamps or flashlights. All specimens were captured by hand or caught by net (for example tadpoles), photographed and released back to the original capture site (except for selected voucher specimens collected during the 2014 survey). Specimens were humanely euthanized by injecting reptiles and submerging frogs in tricaine methanesulfonate (MS222) solution (Conroy *et al.* 2009), after which they were formalin-fixed for 48 hours and transferred to 70% ethanol for long-term storage at the herpetological collection of Lúrio University (Mozambique), with a representative collection to be donated to Port Elizabeth Museum (South Africa). While returning from the fieldtrip in May 2014, a series of voucher material went missing lost during an automobile vehicle accident. Specimens were identified using relevant field guides (Broadley, 1990; Branch, 1998; Channing, 2001; Marais, 2004; Du Preez and Carruthers, 2009). Species nomenclature was mainly based on Frost (2014).

During the May 2014 survey one caecilian individual was collected at the base of the two Namuli peaks (15.36214°S; 37.07673°E, 1551 m a.s.l). The specimen had an estimated SVL of *ca.* 25 cm and 156 annuli from behind the head to the posterior terminus of the body (Fig. 1). The tentacle was situated just behind the nostril, with the eye spot at the base of tentacle visible (Fig. 2).

The dorsal colouration in life was dark purple and ventral light pinkish. No further details could be provided as the specimen went missing during the accident. South of 10°S latitude only two species of caecilian occur on the African continent, i.e. *Boulengerula changamwensis* and *Scolecomorphus kirkii*. Both species have only been recorded from three localities in the south of Malawi (Mercurio, 2011; Channing, 2001). One historical caecilian (*Scolecomorphus kirkii* – PEM A10666) record was reported from dry transitional miombo vegetation at the edge of Serra Mecula, northern Mozambique (Branch, 2004). The new record represents only the second country record and extends the distribution of the species 350 km further south (Fig. 3). Branch (2004) noted that the Serra Mecula specimen may represent an undescribed taxon. Currently, genetic studies are underway to determine the relationship of the Mozambique records to those of Malawi and Tanzania.

During the current surveys of the herpetofauna of Mount Namuli, 14 amphibian and 18 reptile species were recorded in total. This adds an additional three amphibian (*Arthroleptis xenodactyloides*, *Phrynobatrachus mababiensis*, *Scolecomorphus kirkii*) and eight reptile (*Kinixys belliana*, *Agama mossambica*, *Melanoseps cf. loveridgei*, *Afroablepharus wahlbergii*, *Philothamnus angolensis*, *Thelotornis mossambicanus*, *Lycophidion acutirostre*, *Psammophylax variabilis*) species to the annotated checklist of the herpetofauna of Mount Namuli region (Table 1), bringing the total number of species up to 39 (16 amphibians and 23 reptiles).

**Table 1.** Annotated checklist of the herpetofauna of Mount Namuli, Nampula Province, Mozambique (+ recorded, - not recorded).

Species	Portik et al., 2012	Current Study
<b>Amphibia</b>		
<i>Arthroleptis francei</i>	+	+
<i>Arthroleptis xenodactyloides</i>	-	+
<i>Breviceps mossambicus</i>	+	+
<i>Amietophrynus gutturalis</i>	+	+
<i>Amietophrynus maculatus</i>	+	+
<i>Africalus brachynemis</i>	+	-
<i>Hyperolius cf. nasutus</i>	+	-
<i>Hyperolius marmoratus albofasciatus</i>	+	+
<i>Hyperolius cf. spinigularis</i>	+	+
<i>Hyperolius substriatus</i>	+	+
<i>Phrynobatrachus nababiensis</i>	-	+
<i>Psychadena sp.</i>	-	+
<i>Amietia quecketti</i>	+	+
<i>Nothophryne broadleyi</i>	+	+
<i>Strongylopus fuelleborni</i>	+	+
<i>Scolecomorphus kirkii</i>	-	+
<b>Reptilia</b>		
<i>Kinyaxys belliana</i>	-	+
<i>Acanthocercus atricollis</i>	+	-
<i>Agama kirkii</i>	+	-
<i>Agama mossambica</i>	-	+
<i>Chamaeleo dilepis</i>	+	+
<i>Rhampholeon tilburyi</i>	+	+
<i>Hemidactylus mabouia</i>	+	+
<i>Lygodactylus capensis</i>	+	+
<i>Lygodactylus regulus</i>	+	-
<i>Melanoseps cf. loveridgei</i>	-	+
<i>Afroablepharus wahlbergii</i>	-	+
<i>Trachylepis margaritifera</i>	+	+
<i>Trachylepis striata</i>	+	+
<i>Trachylepis varia</i>	+	+
<i>Philothamnus angolensis</i>	-	+
<i>Thelotornis mossambicanus</i>	-	+
<i>Naja melanoleuca</i>	+	-
<i>Boaedon fuliginosus</i>	+	+
<i>Lycophidion acutirostre</i>	-	+
<i>Psammophylax variabilis</i>	-	+
<i>Natriciteres sylvatica</i>	-	+
<i>Atheris mabuensis</i>	+	-
<i>Bitis arietans</i>	+	+

**Acknowledgments.** The Lost Mountain Film (<http://www.thelostmountainfilm.com/>) and their different partnerships made these surveys possible. Simon Loader (University of Basel, Switzerland) provided a pre-review of the note. Proof reading provided by Christa Conradie.

## Literature Cited

AmphibiaWeb (2015): Information on amphibian biology and conservation. [web application]. Berkeley, California: Amphibiaweb. Available at: <http://amphibiaweb.org/>. Last accessed on 4 January 2015.

- Bayliss, J., Timberlake, J.R., Branch, W.R., Bruessow, C., Collins, S., Congdon, C., Curran, M., de Sousa, C., Dowsett, R.J., Dowsett-Lemaire, F., Fishpool, L.D.C., Harris, T., Georgiardi, S., Kopp, K., Liggitt, B., Monadjem, A., Patel, H., Ribeiro, D., Spottiswoode, C., Taylor, P., Willcock, S., Smith, P. (2012): The discovery, biodiversity and conservation of Mabu forest – the largest mid-altitude rainforest in southern Africa. *Oryx* **48**: 177-185.
- Bayliss, J., Monteiro, J., Fishpool, L., Congdon, C., Bampton, I., Bruessow, C., Matimele, H., Banze, A., Timberlake, J. (2010): Biodiversity and conservation of Mount Inago, Mozambique. Report produced under the Darwin Initiative Award 15/036. Royal Botanic Gardens, Kew. Available at: [http://www.kew.org/sites/default/files/Inago%20report%20Nov%202010\\_low.pdf](http://www.kew.org/sites/default/files/Inago%20report%20Nov%202010_low.pdf) Last accessed on 26 January 2015.
- Branch, W.R. (1998): Field guide to the snakes and other reptiles of southern Africa. Struik, Cape Town.
- Branch, W.R. (2004): Herpetological Survey of the Niassa Game Reserve. Technical report prepared for Sociedade para a Gestão e Desenvolvimento da Reserva do Niassa Moçambique. 59. Unpublished report.
- Branch, W.R., Bayliss, J. (2009): A new species of *Atheris* (Serpentes: Viperidae) from northern Mozambique. *Zootaxa* **2113**: 41-54.
- Branch, W.R., Tolley, K.A. (2010): A new chameleon (Sauria: Chamaeleonidae: *Nadzikambia*) from Mount Mabu, Northern Mozambique. *African Journal of Herpetology* **59**: 157-172.
- Branch, W.R., Bayliss, J., Tolley, K.A. (2014): Pygmy chameleons of the *Rhampholeon platyceps* complex (Squamata: Chamaeleonidae): Description of four new species from isolated 'sky islands' of northern Mozambique. *Zootaxa* **3814**: 001-036.
- Branch, W.R., Rödel, M.-O., Marais, J. (2005): Herpetological survey of the Niassa Game Reserve, northern Mozambique – Part I: Reptiles. *Salamandra* **41**: 195-214.
- Broadley, D.G. (1990): FitzSimons' Snakes of Southern Africa (Revised Edition). Jonathan Ball & Ad. Donker. Parklands.
- Channing, A. (2001): Amphibians of Central and Southern Africa. Cornell University Press, New York.
- Conroy, C.J., Papenfuss, T., Parker, J., Hahn, N.E. (2009): Use of Tricaine Methanesulfonate (MS222) for Euthanasia of Reptiles. *Journal of the American Association for Laboratory Animal Science* **48**: 28-32.
- Daniels, S.R., Bayliss, J. (2012): Neglected refugia of biodiversity: mountainous regions in Mozambique and Malawi yield two novel freshwater crab species (Potamonautidae: *Potamonautes*). *Zoological Journal of the Linnean Society* **164**: 498-509.
- Du Preez, L.H., Carruthers, V.C. (2009): A Complete Guide to the Frogs of Southern Africa. Struik Nature, Cape Town.
- Marais, J. (2004): A complete Guide to the Snakes of Southern Africa. Struik, Cape Town.
- Mercurio, V. (2011): Amphibians of Malawi, an analysis of their richness and community diversity in a changing landscape. Edition Chimaira, Frankfurt/M.
- Pascal, O. (2011): The Coastal Forests of Northern Mozambique, 2008 - 2009 expeditions. « Our Planet Reviewed » Programme report n°1. Pro-Natura international / Muséum national d'Histoire naturelle, Paris.

- Portik, D.M., Mulungu, E., Sequeira, D., McEntee, J.P. (2013a): Herpetological surveys of the Serra Jaci and Namuli massifs, Mozambique, and an annotated checklist of the southern Afromontane archipelago. *Herpetological Review* **44**: 394-406.
- Portik, M. O., Travers, S.L., Bauer, A.M., Branch, W.R. (2013b): A new species of *Lygodactylus* (Squamata: Gekkonidae) endemic to Mount Namuli, an isolated 'sky island' of northern Mozambique. *Zootaxa* **3710**: 415-435.
- Poynton, J.C., Broadley, D.G. 1991. Amphibia Zambesiaca 5. Zoogeography. *Annals of the Natal Museum* **32**: 221-277.
- Taylor, P.J., Stoffberg, S., Mondjem, A., Schoeman, M.C., Bayliss, J., Cotterill, F.P.D. (2012): Four New Bat Species (*Rhinolophus hildebrandtii* Complex) Reflect Plio-Pleistocene Divergence of Dwarfs and Giants across an Afromontane Archipelago. *PLoS ONE* **7**: e41744.
- Timberlake, J.R., Bayliss, J., Alves, T., Baena, S., Francisco, J., Harris, T., de Sousa, C. (2007): The Biodiversity and Conservation of Mount Chipirone, Mozambique. Report produced under the Darwin Initiative Award 15/036. Royal Botanic Gardens, Kew, London. Available at: [http://www.iiam.gov.mz/documentos/chiperone\\_technical\\_report.pdf](http://www.iiam.gov.mz/documentos/chiperone_technical_report.pdf) Last accessed on 26 January 2015.
- Timberlake, J.R., Bayliss, J., Dowsett-Lemaire, F., Conghan, C., Branch, W.R., Collins, S., Curran, M., Dowsett, R.J., Fishpool, L., Francisco, J., Harris, T., Kopp, M., de Sousa, C. (2012): Mt. Mabu, Mozambique: Biodiversity and Conservation. Report produced under the Darwin Initiative Award 15/036. Royal Botanic Gardens, Kew, London. Available at: [http://www.kew.org/sites/default/files/kppcont\\_067897.pdf](http://www.kew.org/sites/default/files/kppcont_067897.pdf) Last accessed on 26 January 2015.
- Timberlake, J.R., Dowsett-Lemaire, F., Bayliss, J., Alves, T., Baena, S., Bento, C., Cook, K., Francisco, J., Harris, T., Smith, P., de Sousa, C. (2009): Mt. Namuli, Mozambique: Biodiversity and Conservation. Report produced under the Darwin Initiative Award 15/036. Royal Botanic Gardens, Kew, London. Available at: [http://www.iiam.gov.mz/documentos/darn/publicacoes/namuli\\_repor\\_final\\_2009.pdf](http://www.iiam.gov.mz/documentos/darn/publicacoes/namuli_repor_final_2009.pdf) Last accessed on 26 January 2015.
- Uetz, P. (2015): The Reptile Database. Available at: <http://www.reptile-database.org>. Last accessed on 4 January 2015.