

LIFE HISTORY NOTES ON LOVERIDGE'S LIMBLESS SKINK *MELANOSEPS LOVERIDGEI* BRYGOO & ROUX-ESTÈVE, 1981 (SAURIA: SCINCIDAE: FEYLININAE)

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Abstract: Burrowing limbless and slender skinks of the genus *Melanoseps* have been assumed to be oviparous. Our field observations, however, indicate *Melanoseps loveridgei* from Kitobo forest is viviparous and has a litter size of three young.

Key Words: Lizard, *Melanoseps pygmaeus*, viviparity, breeding, Reptilia, Kitobo forest, Kenya, Africa.

Resumen: P. Malonza and B.A. Bwong. "Notas sobre historia natural del esquinco sin patas *Melanoseps loveridgei* Brygoo & Roux-Estève, 1981 (Sauria: Scincidae: Feylininae)". Los esquinco fosoriales delgados y sin patas del género *Melanoseps* han sido considerados por muchos años como vivíparos. Nuestras observaciones de campo indican, sin embargo, que *Melanoseps loveridgei* de Kitobo forest es vivíparo y que tiene una camada de tres crías.

Key Words: Lagarto, *Melanoseps pygmaeus*, viviparidad, reproducción, Reptilia, Kitobo forest, Kenia, África.

INTRODUCTION

Melanoseps Boulenger, 1887 is an African genus of small and slender, shinnny-bodied limbless skinks (see Spawls *et al.* 2002). Because of their burrowing habits, they are often overlooked and consequently their life style is virtually unknown and causes them to be regarded as rare where they occur. Six species are known from Eastern Africa with three regarded as endemic to Tanzania (e.g. Broadley and Howell 1991, Spawls *et al.* 2002, Broadley *et al.* 2006). There has been no past record of any *Melanoseps* species in Kenya. However, the first record was made in November 2005 by P.K. Malonza and G.J. Measey, and April 2006 by B.A. Bwong and G.J. Measey in Longo-mwagadi forest, Shimba Hills National Reserve (UTM: 546591; 9531127; altitude 396 m). We have assigned the species to *Melanoseps pygmaeus* Broadley, Whiting & Bauer, 2006. Later, a single specimen assignable to *Melanoseps loveridgei* Brygoo & Roux-Estève, 1981 was collected in Mt. Kasigau forest (UTM: 461005, 9577326; altitude 1095 m), Taita Hills by P.K. Malonza in April 2006, and further specimens of the same species were later collected in Kitobo forest (UTM: 9619706, 346407; altitude 737 m), Taveta in December 2007 and all the individuals accessioned (L/3104/1-14) and stored at National Museums of Kenya (NMK), Nairobi Herpetology collection.

Melanoseps loveridgei is a wide-ranging fossorial savanna scincid lizard known from south-eastern Katanga in Democratic Republic of Congo, northern Mozambique, through eastern to northern Tanzania. *M. loveridgei* has been regarded to be

polyphyletic and may reflect the presence of cryptic taxa. Its body is generally dark grey to black and of intermediate size in relation to other species (see Broadley *et al.* 2006). Initially all *Melanoseps* species were presumed to be oviparous (egg layers, see Spawls *et al.* 2002). However, recent reports from preserved specimens have hinted that some species may be viviparous (e.g., Broadley *et al.* 2006). We herein briefly provide novel data on the life history (ecological characteristics and breeding habits) of *Melanoseps loveridgei* based on field observations in Kitobo forest.

MATERIALS AND METHODS

Study area

Field observations were done in Kitobo forest, a lowland forest (ca. 750 m a.s.l.) located about 10 km Southeast of Taveta town and Mt. Kilimanjaro in Taita-Taveta district, Kenya, Africa.

Sampling

Field work in the study area lasted five days from 7 to 11 December 2007. During this period the forest soils were relatively dry.

Time limited search (TLS), a form of timed species counts (TSC) similar to those described by Karns (1986) and Sutherland (1996) was used to sample these limbless skinks. TLS were done randomly within the forest for one person hour. Intensive herpetofaunal sampling in all possible microhabitats involved turning over and

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digging within leaf litter, debris, decomposing tree stumps and logs using a jembe (metallic hoe) fixed on a long wooden handle. Voucher specimens were fixed in 10% formalin after being euthanized, while tissue samples were stored in absolute ethanol for future genetic analysis. Voucher specimens collected are deposited at National Museums of Kenya (NMK), Nairobi herpetological collection. GPS data were taken using a 12 channel Garmin® receiver.

RESULTS

Ecological characteristics

In Kitobo forest, *Melanoseps loveridgei* was mainly found within decomposing logs, leaf litter and forest debris on loose soil. Within these microhabitats the species could only be detected through active digging and turning of debris. Otherwise, no individuals were found on the forest surface. Whenever uncovered, individuals immediately burrowed themselves inside the debris or soil making them hard to capture. The species was recorded on seven (58%) out of 12 TLS samples. In total, 14 individuals (juveniles and adults) were recorded making *M. loveridgei* the most abundant herp species detected in the forest during this period. Measurements of the preserved specimens (snout-vent- length and tail length are given in Table 1. In many cases, more than one individual was found in a single micro-habitat. Sundevall's writhing skink *Lygosoma sundevallii* (A. Smith, 1849), Peter's black Worm snake *Leptotyphlops scutifrons merkeri* (Werner, 1909) and Cape wolf snake *Lycophidion capense* (A. Smith, 1831) were found syntopically with *M. loveridgei*.

Reproductive biology

A gravid female (NMK-L/3104/1), total length 152 mm, was unearthed under decomposing log at around midday of 6th December, 2007. While being handled, it gave birth to a single

young (L/3104/2) on PKM's hands (Fig. 1). At the same site, a recently born juvenile (L/3104/3), total length 74 mm, presumably from the same female, was collected as well. From these results it is shown that a recently born juvenile is about half (74:152) the size of an adult female. Later at the campsite, the same female gave birth to another young while being euthanized. Furthermore, in the lab, three fetuses were removed by dissection from the womb of another female (L/3104/9).

DISCUSSION AND CONCLUSIONS

From our observations we conclude that *Melanoseps loveridgei* prefers decomposing logs and debris as habitats and shelters. It is not necessarily solitary, as we always found more than one individual within one site. Elsewhere in Kenya, these kind of microhabitats also harbor other subterranean herpetofauna such as caecilian amphibians (see Malonza and Measey 2005, Malonza 2008) and reptiles such as blind snakes, worm snakes, burrowing skinks and worm lizards (Spawls *et al.* 2002). Their subterranean behaviour has given the impression that they are rare even in areas where they are locally abundant. This notion has also been the case for fossorial caecilians (Measey 2004). This is because they can only be sampled and quantified through active digging within their preferred microhabitats.

Melanoseps loveridgei is a live bearing scincid lizard having a litter size of three young. However, it is possible that the litter size exceeds the one currently observed. Our findings conflict with earlier presumptions that certain members of *Melanoseps* are oviparous (e.g. Spawls *et al.* 2002). Presumably all *Melanoseps* species are viviparous. Our hypothesis would agree with Broadley *et al.* (2006) who recorded embryos or eggs containing advanced embryos in preserved specimens of *Melanoseps ater* (Günther, 1873), *M. loveridgei*, and *M. pygmaeus*.

TABLE 1. Measurements (in mm) of preserved specimens of *Melanoseps loveridgei* from Kitobo forest. NMK: National Museums of Kenya.

TABLA 1. Medidas (en mm) de ejemplares preservados de *Melanoseps loveridgei* de Kitobo forest. NMK: National Museums of Kenya.

NMK number	Field Number	Snout-vent- lengt	Tail length	Sex
L/3104/1	PKM00702	116	36	Female
L/3104/2	PKM00703	44	15	Juvenile
L/3104/3	PKM00704	56	18	Juvenile
L/3104/4	PKM00687	80	30	-----
L/3104/5	PKM00686	110	30	Female?
L/3104/6	PKM00682	118	tail cut	Female?
L/3104/7	PKM00776	105	tail cut	-----
L/3104/8	PKM00789	116	tail cut	Female?
L/3104/9	PKM00685	114	40	Female
L/3104/10	PKM00792	45	17	Juvenile
L/3104/11	PKM00807	88	25	-----
L/3104/12	PKM00790	97	37	-----
L/3104/13	PKM00684	110	36	Female?
L/3104/14	PKM00791	115	40	Female?



FIG. 1. Female *Melanoseps loveridgei* (L/3104/1) with a new born young (L/3104/2) in the field.

Hembra de Melanoseps loveridgei (L/3104/1) con un neonato (L/3104/2) en el campo.

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REFERENCES

- Broadley, D.G. and K.M. Howell. 1991.** A checklist of the reptiles of Tanzania, with synoptic keys. *Syntarsus* 1:1-70.
- Broadley, D.G., A.S. Whiting and A.M. Bauer. 2006.** A revision of the East African species of *Melanoseps* Boulenger (Sauria:Scincidae:Feylininae). *African Journal of Herpetology* 55:95-112.
- Karns, D.R. 1986.** *Field Herpetology: Methods for the study of amphibians and reptiles in Minnesota.* James Ford Bell Museum of Natural History, University of Minnesota, Occasional Paper 18:1-86.
- Malonza, P.K. 2008.** Amphibian biodiversity in Taita Hills, Kenya. *PhD Thesis.* University of Mainz, Mainz, Germany. 163pp.
- Malonza, P.K. and G.J. Measey. 2005.** Life history of an African caecilian: *Boulengerula taitanus* Loveridge 1935 (Amphibia: Gymnophiona: Caeciliidae). *Tropical Zoology* 18:49-66.
- Measey, G.J. 2004.** Are caecilians rare? An East African perspective. *Journal of East African Natural History* 93:1-21.
- Spawls, S., K. Howell, R. Drewes and J. Ashe. 2002.** *A field guide to the reptiles of East Africa: Kenya, Tanzania, Uganda, Rwanda and Burundi.* Academic Press, San Diego.
- Sutherland, W.J. (ed.) 1996.** *Ecological Census Techniques: A Handbook.* Cambridge University Press.