

First description of the egg with other notes on the biology of Loveridge's Sunbird *Nectarinia loveridgei*

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Loveridge's Sunbird *Nectarinia loveridgei* is endemic to the Uluguru Mountains (06°43'–07°15'S, 37°32'–37°51'E) (BirdLife International 2003), which are part of the Eastern Arc Mountains in Tanzania (Lovett & Wasser 1993). The Ulugurus are a priority site for conservation of vertebrate species and are considered the third most important area in East Africa for the conservation of forest birds (Burgess *et al.* 1998). The Ulugurus hold two strictly-endemic bird species, five endemic subspecies and additionally 12 range-restricted species (Stattersfield *et al.* 1998, BirdLife International 2003). Six of these species are considered to be globally threatened (BirdLife International 2004a). Loveridge's Sunbird seems to be in no immediate danger of extinction and is currently considered of Least Concern (BirdLife International 2004b). While the total population has recently been estimated between 21 000 and 166 000 individuals, the persistence of Loveridge's Sunbird depends upon the conservation of the Uluguru Mountain Forest Reserves (Tøttrup *et al.* 2004).

Loveridge's Sunbird was first described by Hartert (1922) with further notes by Williams (1950, 1951) and Stuart & van der Willigen (1980). Here we present the first description of the egg and additional information on the biology of Loveridge's Sunbird based on observations collected during three months of fieldwork from 29 August to 28 November 2000.

Breeding biology

Between 1 September and 5 October 2000 five nests containing eggs or nestlings and two newly-built nests were found. Fledglings were recorded from 1 September to 28 November. Combined with former notes by Williams (1951) and Cheke *et al.* (2001), this indicates that the species has an extensive breeding season lasting from at least August until March.

The free-hanging and closed nest built at the understorey level (mean height of 3.1 m above ground) has a small protruding part above the entrance hole and is attached to a branch in bushes or small trees (Figure 1). Dried grasses and fresh green moss are most often used as building material. The latter effectively camouflages the nest in the vegetation. The interior of the nest is lined with moss. Cheke *et al.* (2001) reports an entrance hole of 5 cm in diameter and the nest being 15 cm in length and 9 wide. The

Table 1. Measurements of nest characteristics and clutch size of Loveridge's Sunbird *Nectarinia loveridgei*.

Date	Vertical length (cm)	Width (cm)	Nest hole diameter (cm)	Number of pulli/eggs	Height above ground (m)
2 September	16.5	10	3.2	2 pulli	2
4 September	20	9.5	3.3	3 eggs	1.8
7 September				2 pulli	1.5
22 September				2 pulli	2
22 September					3.5
27 September					2.5
5 October	16	10	3.3	2 pulli	1.5
19 November					10
Mean	17.5	9.8	3.3	2.2	3.1

latter two measures accord well with our results (Table 1); however, we found the entrance hole to average 3.3 cm in diameter ($n = 3$), which is considerably smaller than reported by Cheke *et al.* (2001).

One egg measuring 1.2×1.6 cm was photographed. The egg was shiny dark olive-green with an irregular dark pattern. In some areas the dark spots were clustered to form dark shapes, concealing the otherwise dark olive background (Figure 2).

During the breeding season repeated observations were made on two nests, one with eggs and one with nestlings. The female seems to incubate the eggs alone, as no male was seen entering the nest during observation periods. The male was only observed for short periods around the nest with eggs. The nest containing nestlings was visited mostly by the female. The male was observed bringing food to the nestlings through the entrance hole but was never seen to enter the nest. Faecal pellets were only observed being carried away by the female.



Figure 1. The free hanging nest of Loveridge's Sunbird *Nectarinia loveridgei* (left).

Figure 2. The shiny, dark olive-green coloured egg of Loveridge's Sunbird *Nectarinia loveridgei* (above).

Weight

A total of 400 Loveridge's Sunbirds were caught in mist-nets between 1400 and 2520 m asl and weighed before release. The mean weights of adult males and females were 10.7 g ($n = 195$) and 9.2 g ($n = 172$), respectively (Table 2). The sex difference was highly significant ($t = 22.0$, $p < 0.0001$; SAS 2000). Data on 33 juvenile and immature birds are also included in Table 2.

Table 2. Weights of Loveridge's Sunbird *Nectarinia loveridgei*.

	N	Weight (g)	
		Range	Mean (\pm SD)
Ad. Male	195	9.0-12.5	10.7 (± 0.7)
Ad. Female	172	7.5-11.0	9.2 (± 0.6)
Imm. Male	17	9.0-11.5	10.2 (± 0.7)
Imm. Female	8	8.0-10.0	9.3 (± 0.8)
Juv.	8	7.5-10.0	8.8 (± 0.8)

Our results accord with mean weights reported by Cheke *et al.* (2001) based on smaller sample sizes: 10.6 g ($n = 25$) for males and 9.0 g ($n = 24$) for females. We did not control for pregnant females during this breeding period and it is therefore possible that females are normally lighter than we reported.

Survival

A male trapped and ringed as an adult bird during the Uluguru Biodiversity Survey in 1993 (Svendsen & Hansen 1995) was recaptured on 17 November 2000, the bird therefore being at least eight years old at the time of recapture.

Behaviour and distribution

Loveridge's Sunbird was recorded between 1200 and 2560 m and seen in all forest strata including the canopy, where it was observed visiting flowering trees. Males were often observed chasing conspecific males and were recorded singing throughout the day. The first individuals initiated singing 25 min before sunrise and the activity stopped at sunset. Singing intensity was highest during the hour starting 15 min before sunrise, and the hour before sunset.

The species joined mixed feeding flocks, but also fed alone or in pairs, and individuals often gathered in large parties around flowering plants and trees. We observed birds feeding on *Lasianthus cereiflorus* (Rubiaceae) and *Impatiens ulugurensis* (Balsaminaceae), both common in the forest understorey (Jannerup 2004, Grey-Wilson 1980). The nectar diet was supplemented with insects captured by a variety of techniques, including sallying.

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