Biometrics

Biometrics and moult of adult Streakyheaded Canaries *Serinus gularis* at Elandsbaai, South Africa

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Introduction

Streakyheaded Canaries *Serinus gularis* are endemic to sub-Saharan Africa and occur in a variety of habitats including *Brachystegia*, savannah, thornveld and woodlands (Nuttall 1997).

Biometric data have been published for Zimbabwe (Skead 1960, Manson 1986, Jackson 1989, Maclean 1993) and South Africa (Skead 1960, Maclean 1993, Underhill *et al.* 1998). These data sets, except for wing length and mass, are either incomplete or have small sample sizes. Moult data are largely unpublished. Manson (1986) reported on primary moult in Zimbabwe. This paper reports on moult and biometric data in Streakyheaded Canaries from the west coast of South Africa.

Study site and methods

Streakyheaded Canaries were captured and ringed at Verlorenvlei Nature Reserve, Elandsbaai (32°18'S, 18°22'E) between January 2001 and April 2002. No ringing was done in the months of February, September and December. The birds were captured in mist-nets at a water point in an *Acacia cyclops* plantation.

Wing length, mass and primary moult were recorded for all birds. Head, tarsus and tail measurements and secondary and tail moult scores were also taken from a sample of the captured birds. Four head measurements were taken: total head, bill depth and two culmen measurements: bill tip to the feathered base of the bill, and to the union with the skull.

Birds that were moulting P6 or P7 (longest primaries) or T1 or T2 (longest tail feathers) were excluded from this analysis. All measurements and moult scores were taken following de Beer *et al.* (2000).

Results and discussion

Primary moult was recorded in October, November and January, with 1 of 26, 3 of 15 and 9 of 16 birds caught in active moult, respectively (Table 1). No primary moult was recorded in August or March. Ringed adults FA09535 and FA09543 captured on 6 and 7 January 2001 respectively both had moult scores of 22 and were therefore midway through primary moult. The duration of primary moult in Yellowfronted Canaries *Serinus mozambicus* is approximately 120 days (Earlé 1981). It can be argued that both ringed birds would have needed an additional 60 days to complete the primary moult. An adult FA15136 caught and ringed on 3 October 2001 had a moult score of 18. This bird would have begun its primary moult in September. Primary moult therefore occurred from September to March. Streakyheaded Canaries in the Western Cape breed from August to January (Nuttall 1997). Manson (1989) recorded primary moult in Zimbabwe in October and January–July. Breeding occurs from September to March (Maclean 1993). Primary moult in Streakyheaded Canaries therefore starts very soon after the commencement of breeding.

Secondary moult was recorded in October,

Table 1. Primary moult protocols for Streakyheaded Canaries at Elandsbaai, Western Cape.

Ring	Date	Right wing moult protocols	Moult score
FA09521	6 January 2001	555555310	34
FA09525	6 January 2001	555543200	29
FA09526	6 January 2001	555522200	26
FA09535	6 January 2001	555331000	22
FA09543	7 January 2001	555421000	22
FA09548	7 January 2001	555555542	41
FA09549	7 January 2001	555432000	24
FA09552	7 January 2001	555555320	35
FA09554	7 January 2001	555555421	38
FA15134	3 October 2001	555300000	18
FA15167	9 November 2001	400000000	4
FA15177	10 November 2001	400000000	4
FA15194	14 November 2001	555400000	19

Table 2. Measurements of Streakyheaded Canaries.

Locality	Head	Culmen (base of feathers)	Culmen (union with skull)	Bill depth	Tail	Wing	Tarsus
Elandsbaai[1]:							
mean	30.5	13.2	15.4	7.6	61.8	75.2	17.0
range	27.8–35.5	11.2–17.2	12.5–17.1	6.8–8.6	58–68	71.5–80.0	15.0–18.1
S.D.	1.09	1.21	0.94	0.32	2.01	1.83	0.60
sample size	70	70	69	69	59	107	67
Western Cape[2]:							
mean						75.0	
range						73–77	
S.D.						2.0	
sample size						3	
Zimbabwe[3]:							
mean		11.6			60.3	77.4	15.9
range		10.0–13.0			49.5–66.0	72.0–83.0	13.0–17.0
S.D.		0.91			2.77	2.17	1.29
sample size		15			83	120	14
Angola[4]:							
mean						82	
range							
S.D.							
sample size						1	

[1] This study. A total of 112 birds was captured; measurements (in mm) were taken of every bird.
[2] Underhill *et al.* (1998)
[3] Manson (1986)
[4] Ripley & Heinrich (1966)

Table 3. Mass (in grams) of Streakyheaded Canaries in southern Africa.

Locality	Range	Mean	S.D.	N	Source
Elandsbaai	16.7–24.8	20.3	1.57	112	This study
Cape	20–26	21.9	–	67	Maclean (1993)
Transvaal	17–25	20.1	–	50	Maclean (1993)
Zimbabwe	12.9–21.0	16.35	–	122	Manson (1986)

November, January and March–April. No adults in secondary moult were recorded in August or June. Tail moult was recorded in November, January, March and April and no moulting birds were recorded in August or May. Moult of the contour (body) feathers was recorded in October, November, January and March–May. All of the birds captured in March–May were in body moult and no moult was recorded in August or June. Moult of these tracts is slightly retarded relative to primary moult.

The biometric data sets collected at Elandsbaai did not have a bimodal distribution and therefore adult birds cannot be sexed on measurements. Adult Streakyheaded Canaries cannot be sexed on the basis of plumage differences (Maclean 1993). There is an increase in wing length towards the north of the species range, for example the mean value at Elandsbaai is 75.2 mm compared with 77.4 mm in Zimbabwe and 82 mm in Angola. Culmen, tail and tarsus measurements show an opposite trend (Table 2).

Streakyheaded Canaries in South Africa have approximately the same mean mass but are ±4 g (~25%) heavier than birds reported from Zimbabwe (Manson 1986, Jackson 1989) (Table 3). Ripley & Heinrich (1966) reported a mass of 16 g from a bird collected in Angola. The data therefore suggests that Streakyheaded Canaries are heavier in the south of its range. Jackson (1989) stated that this species followed Bergmann's rule, namely that body-size increases in cooler latitudes.

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