Biometrics and moult of Grey-backed Sparrow-lark *Eremopterix verticalis* in the Karoo, September 2023

Graeme Hatley, H Dieter Oschadleus, Les G Underhill, Jean Ramsay


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Abstract

The biometrics of Grey-backed Sparrow-larks *Eremopterix verticalis* in the handbooks are based on small samples. We summarize wing-length, tail-length and mass of a sample of 130 Grey-backed Sparrow-larks mistnetted during ringing on the farm New Holme, Hanover District, Northern Cape, South Africa, in September 2023. The habitat was Grassy Karoo with, on average, March being the month of peak annual rainfall. The sample consisted of 58 females and 72 males. We examined birds for primary moult; 5% had moulted either one or two primaries, indicating that moult was commencing in the population as a whole. This observation, set in the context of an observation made in Namibia, suggests that this species undertakes a pre-breeding moult in spring and summer, prior to breeding in late summer and autumn.
chini (1987) had been applied to estimate the parameters of moult. The larks are not represented in that database. Hockey et al. (2005) wrote 31 species texts for the larks occurring in southern Africa; for 15 of these species the section on moult was reduced to “no data”, and for the remainder the available knowledge can be summarized as severely incomplete. We therefore also report the primary moult data we observed.

Methods

We mistnetted Grey-backed Sparrow-larks at two waterholes at a windpump (30.8988°S, 24.6626°E) on the farm New Holme, Hanover, Northern Cape, on 3, 6 and 9 September 2023 (Figures 1–4). The vegetation in the area is Grassy Karoo (Allan et al. 1997). One of the waterholes was within 10 m of the concrete reservoir at the windpump, and the water consisting of the overflow, and of seepage when there was no wind. The other waterhole was 150 m distant and was purpose-built for birds, continuously fed by a trickle of water brought to the site by a plastic pipe from a sheep drinking trough. The birds used both water sources. This is likely to have been the only available water within a radius of several kilometres, and loose flocks of up to c. 100 birds arrived intermittently to drink. The mistnets were erected at about 08h00 and taken down by 12h00. The birds were ringed with Safring 2.3 mm-diameter rings. Birds were aged and sexed as described by Tippett (2023). Measurements were made, and primary moult recorded, as described by de Beer et al. (2000). Coincidently, the type specimen of Grey-backed Sparrow-lark was collected within 70 km of of this study site, at Colesberg, by Andrew Smith between 1834 and 1836 (Smith 1836).

Results and Discussion

We handled a total of 130 Grey-backed Sparrow-larks on the three fieldwork days (Table 1). On 6 September, the waterholes had completely frozen over, and the birds had to wait for them to thaw before coming to drink (Figure 4). On 9 September, there was a steady breeze by 08h00, and this resulted in fewer birds being trapped in the mistnets (Table 1). On 6 and 9 September, we made no retraps of birds ringed on previous days. We can make no realistic estimate of the number of sparrow-larks which used these two waterholes, but it was probably at least 1,000 birds.

Table 1: Numbers of female and male Grey-backed Sparrow-larks mistnetted at New Holme, Hanover, Northern Cape.

<table>
<thead>
<tr>
<th>Date</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 September 2023</td>
<td>27</td>
<td>29</td>
<td>56</td>
</tr>
<tr>
<td>6 September 2023</td>
<td>23</td>
<td>31</td>
<td>54</td>
</tr>
<tr>
<td>9 September 2023</td>
<td>8</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>58</strong></td>
<td><strong>72</strong></td>
<td><strong>130</strong></td>
</tr>
</tbody>
</table>
Figure 1: View of the habitat which the Grey-backed Sparrow-larks were occupying on the farm New Holme, Hanover District, Northern Cape, South Africa. This is classified as Grassy Karoo. The photo was taken on 7 September 2023. It shows the seasonal drought at the end of the harsh cold winter before the arrival of the summer rains. This area had experienced above average rainfall the previous summer.

Photo credit: Les Underhill
Figure 2: Setting up mistnets near the circular concrete reservoir on 3 September 2023. The area with green grass at the far end of the mist-net has standing water when the wind blows and the dam overflows. Photo credit: Les Underhill

Figure 3: Mistnet set up at dawn on 9 September 2023 at the purpose-built waterhole fed by a trickle of water from the circular concrete reservoir of Figure 1. Photo credit: Graeme Hatley
Figure 4: Grey-backed Sparrow-larks wait for the ice to thaw before they can drink on 6 September 2023. This is the waterhole of Figure 3.

Photo credit: Les Underhill
Hatley et al: Biometrics and moult of Grey-backed Sparrow-lark

**Table 2:** Summary statistics of wing, tail and mass measurements of Grey-backed Sparrow-Larks at New Holme, Hanover. The samples sizes were 58 females, 72 males and 130 in total; all measurements were made on each bird.

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Female Mean (SD)</th>
<th>Male Mean (SD)</th>
<th>All Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wing (mm)</td>
<td>80.6 (1.5)</td>
<td>82.7 (1.7)</td>
<td>81.8 (1.9)</td>
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<tr>
<td></td>
<td>77.0–83.5</td>
<td>79.0–87.5</td>
<td>77.0–87.5</td>
</tr>
<tr>
<td>Tail (mm)</td>
<td>45.2 (1.2)</td>
<td>46.7 (2.1)</td>
<td>46.0 (2.0)</td>
</tr>
<tr>
<td></td>
<td>41.5–48.0</td>
<td>42.5–51.0</td>
<td>41.5–51.0</td>
</tr>
<tr>
<td>Mass (g)</td>
<td>17.5 (0.9)</td>
<td>17.2 (1.1)</td>
<td>17.3 (1.0)</td>
</tr>
<tr>
<td></td>
<td>16.1–20.3</td>
<td>13.9–19.5</td>
<td>13.9–20.3</td>
</tr>
</tbody>
</table>

relatively, and 2.9 mm and 2.3 mm shorter than ours (Table 2). Their tail measurements are c. 4 mm longer than ours. The source of their measurements is not given, but it is likely that they were made on museum specimens, which are difficult to measure. Their average masses, 17.2 g for females and 17.4 g for males, are similar to ours, and are referenced to two sources (Willoughby 1971, Herholdt 1988).

**Primary moult**

Of 127 birds examined for primary moult, six (5%) had moulted their first one or two primaries. The most advanced moult score was 3207 (using the standard protocol for describing moult: the first primary at growth stage 3, the second at stage 2, and the remaining seven primaries old (de Beer et al. 2000)).

During fieldwork in the Namib Desert, Namibia, in the summer of 1965/66, Willoughby (1971) found that primary moult started in late September and was completed during February, prior to the start of breeding in March, as evidenced by testicle size in males. Passerines generally moult their primaries after breeding. For example, in the weavers (Ploceidae), all species other than Seychelles Fody *Foudia sechellarum* moult their primaries after breeding (Oschadleus & Andersson 2023). In desert environments, there is frequently large variation in the timing of breeding, and the subsequent moult, with erratic rainfall events being the trigger.

The timing of the start of moult recorded by Willoughby (1971) coincides closely with our observations. The tentative conclusion is that Grey-backed Sparrow-lark undertakes a pre-breeding primary moult during spring and mid-summer. On average, but with considerable inter-annual variation, the month with the largest average rainfall is March, in both the Nama Karoo into which our study site falls, and at Willoughby’s (1971) study site in the Namib Desert (Allan et al. 1997). Breeding takes place in late summer when arthropod abundance to meet the food demands of growing chicks is, on average, at its maximum (Willoughby 1971). For bird species which do not undertake long-distance migration, breeding and moult are the two most energy-demanding periods in the annual schedule. If primary moult took place after breeding for this species, it would occur during the cold winter period, when food abundance is minimal. It is thus an effective strategy to moult in spring to mid-summer. Even though conditions are, on average, too dry for food to be abundant, environmental conditions are warm, and conditions more favourable for moult than in winter.

Studies of the timing of breeding and moult are needed for the species that breed in the arid west of southern Africa. This is the region where, on average, the timing of peak rainfall is in late summer, so that food abundance is greatest in early autumn. For bird species that moult after breeding, the strategy used by the majority, they do so in winter, probably the most challenging period of the year. It will be interesting to see how many bird species in this arid western zone have switched to a pre-breeding moult strategy.

**Acknowledgements**

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References


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