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Echeverría, V., Estades, C. F., Botero-Delgadillo, E., Wingfield, J. C. and González-Gómez, P. L. 2018. Pre-basic molt, feather quality, and modulation of the adrenocortical response to stress in two populations of rufous-collared sparrows *Zonotrichia capensis*. – J. Avian Biol. 2018: e01892

Supplementary material

Appendix 1

Table A1. Temperature and precipitation in the Atacama Desert (AR) and Fray Jorge National Park (FJ).

| Years 1981-2010 | AR | | | | FJ | | | |
|-----------------|--------|--------|--------|-----|--------|--------|--------|------|
| Month | T° Med | T° Max | T° Min | PP | T° Med | T° Max | T° Min | PP |
| | °C | °C | °C | mm | °C | °C | °C | mm |
| Jan | 22.4 | 26.0 | 19.7 | 0.1 | 17.2 | 21.4 | 14.0 | 0.2 |
| Feb | 22.5 | 26.4 | 19.8 | 0.1 | 17.1 | 21.4 | 14.0 | 0.1 |
| Mach | 21.7 | 25.5 | 19.3 | 0.3 | 16.1 | 20.6 | 13.2 | 0.9 |
| April | 19.9 | 23.7 | 17.2 | 0.0 | 14.0 | 18.4 | 11.0 | 0.8 |
| May | 18.0 | 21.4 | 15.6 | 0.1 | 12.4 | 16.9 | 9.6 | 11.1 |
| June | 16.7 | 19.4 | 14.8 | 0.2 | 11.1 | 15.8 | 8.1 | 20.8 |
| July | 15.9 | 18.4 | 14.3 | 0.4 | 10.7 | 15.5 | 7.6 | 31.9 |
| August | 16.0 | 18.4 | 14.7 | 0.1 | 11.1 | 15.7 | 8.2 | 15.2 |
| September | 16.6 | 19.2 | 15.1 | 0.1 | 12.0 | 16.4 | 8.9 | 3.1 |
| October | 17.8 | 20.6 | 16.0 | 0.0 | 13.1 | 17.4 | 9.8 | 1.6 |
| November | 19.4 | 22.4 | 17.1 | 0.0 | 14.4 | 18.5 | 11.2 | 0.3 |
| Dicember | 21.0 | 24.3 | 18.3 | 0.1 | 15.9 | 20.0 | 12.6 | 0.2 |
| Anual | 19.0 | 22.1 | 16.8 | 0.1 | 13.8 | 18.2 | 10.7 | 7.2 |

Table A2. Relation between baseline corticosterone and feather area, insertion length, and total length of wing, tail, and body feathers of rufous-collared sparrows.

| | | AR | | | | | | | | FJ | | | | | | | |
|--------|------------------|-----------------------|----------------|-------|--------------|-----------------------|----------------|-------|--------------|-----------------------|----------------|------|------|-----------------------|----------------|------|------|
| | | New feathers (n = 23) | | | | Old feathers (n = 70) | | | | New feathers (n = 23) | | | | Old feathers (n = 23) | | | |
| Region | | Estimate | r ² | F | P | Estimate | r ² | F | P | Estimate | r ² | F | P | Estimate | r ² | F | P |
| Tail | Total length | -0.357 | 0.54 | 26.64 | 0.001 | -0.11 | 0.1 | 7.73 | 0.007 | -0.029 | 0.03 | 0.7 | 0.4 | 0.02 | 0.03 | 1.73 | 0.19 |
| | Area | -0.074 | 0.03 | 0.9 | 0.35 | 0.01 | 0.002 | 0.19 | 0.65 | 0.017 | 0.01 | 0.23 | 0.63 | 0.015 | 0.005 | 0.24 | 0.62 |
| | Insertion length | -0.047 | 0.23 | 7.54 | 0.01 | -0.02 | 0.2 | 17.24 | 0.001 | -0.006 | 0.013 | 0.3 | 0.58 | -0.08 | 0.07 | 3.68 | 0.06 |
| Wing | Total length | -0.36 | 0.53 | 27.63 | 0.001 | -0.13 | 0.19 | 16.26 | 0.001 | -0.006 | 0.003 | 0.07 | 0.79 | 0.004 | 0.002 | 0.11 | 0.73 |
| | Area | -0.02 | 0.0001 | 0.23 | 0.63 | 0.0001 | 0.0002 | 0.008 | 0.92 | -0.01 | 0.006 | 0.13 | 0.71 | -0.012 | 0.004 | 0.2 | 0.65 |
| | Insertion length | -0.04 | 0.23 | 7.54 | 0.01 | -0.02 | 0.2 | 17.24 | 0.001 | -0.01 | 0.01 | 0.3 | 0.58 | 0.008 | 0.07 | 3.68 | 0.06 |

Table A3. Relation between stress-induced corticosterone and feather area, insertion length, and total length of wing, tail, and body feathers of rufous-collared sparrows.

| Region | AR | | | | | | | | FJ | | | | | | | | |
|--------|----------------------|----------------|--------|------|-----------------------|----------------|-------|------|-----------------------|----------------|-------|------|-----------------------|----------------|--------|------|------|
| | New feathers (n = 6) | | | | Old feathers (n = 91) | | | | New feathers (n = 14) | | | | Old feathers (n = 58) | | | | |
| | Estimate | r ² | F | P | Estimate | r ² | F | P | Estimate | r ² | F | P | Estimate | r ² | F | P | |
| Tail | Total length | 0.004 | 0.02 | 0.09 | 0.77 | -0.012 | 0.06 | 6.34 | 0.013 | 0.001 | 0.006 | 0.36 | 0.54 | -0.001 | 0.001 | 0.01 | 0.89 |
| | Area | 0.0009 | 0.06 | 0.25 | 0.63 | -0.003 | 0.009 | 0.85 | 0.35 | 0.01 | 0.18 | 2.69 | 0.12 | 0.0001 | 0.0003 | 0.01 | 0.89 |
| | Insertion length | 0 | 0 | 0.02 | 0.87 | -0.002 | 0.092 | 9.03 | 0.003 | 0.001 | 0.03 | 0.4 | 0.53 | 0 | 0.039 | 2.29 | 1.35 |
| Wing | Total length | 0.006 | 0.09 | 2.34 | 0.13 | -0.009 | 0.04 | 2.88 | 0.09 | -0.07 | 0.11 | 2.96 | 0.09 | 0.001 | 0.01 | 0.53 | 0.47 |
| | Area | -0.001 | 0.0005 | 0.01 | 0.91 | -0.05 | 0.03 | 2.51 | 0.11 | -0.006 | 0.02 | 0.52 | 0.47 | -0.006 | 0.04 | 1.92 | 0.17 |
| | Insertion length | -0.001 | 0.005 | 0.13 | 0.71 | -0.001 | 0.06 | 4.73 | 0.03 | 0.001 | 0.005 | 0.06 | 0.79 | -0.005 | 0.01 | 0.49 | 0.48 |

Table A4. Wing, tail, and body feather quality variables in Rufous-collared sparrow in the Atacama Desert (AR) and Fray Jorge National Park (FJ).

| Variable | | Mean \pm SE | | N | |
|----------------------------|-------|-------------------|-------------------|----|----|
| | | AR | FJ | AR | FJ |
| Total length (cm) | Wing | 5.71 \pm 0.05 | 5.87 \pm 0.06 | 97 | 70 |
| | Tail | 6.35 \pm 0.06 | 6.59 \pm 0.07 | 95 | 70 |
| | Body | 3.00 \pm 0.08 | 3.14 \pm 0.09 | 81 | 53 |
| Insertion length (cm) | Wing | 0.69 \pm 0.01 | 0.71 \pm 0.01 | 97 | 70 |
| | Tail | 0.58 \pm 0.01 | 0.60 \pm 0.01 | 96 | 70 |
| | Body | 0.13 \pm 0.01 | 0.15 \pm 0.01 | 78 | 53 |
| Area (cm ²) | Wing | 4.03 \pm 0.05 | 3.98 \pm 0.06 | 97 | 70 |
| | Tail | 4.09 \pm 0.06 | 4.15 \pm 0.06 | 96 | 70 |
| | Body | 3.22 \pm 0.13 | 3.60 \pm 0.17 | 80 | 53 |
| Rachis width (mm) | Wing | 0.83 \pm 0.01 | 0.84 \pm 0.01 | 97 | 70 |
| | Tail | 0.71 \pm 0.05 | 0.73 \pm 0.07 | 96 | 70 |
| | Body | 0.26 \pm 0.06 | 0.28 \pm 0.01 | 82 | 54 |
| Barbs / mm ² | Wing | 4.03 \pm 0.05 | 3.98 \pm 0.06 | 97 | 70 |
| | Tail | 4.09 \pm 0.06 | 4.15 \pm 0.07 | 96 | 70 |
| | Body | 3.22 \pm 0.13 | 3.60 \pm 0.17 | 80 | 53 |
| Bárbulas / mm ² | Wing | 305.82 \pm 3.28 | 317.51 \pm 3.89 | 97 | 70 |
| | Tail | 309.52 \pm 3.43 | 319.74 \pm 4.02 | 96 | 70 |
| % Fault bars | Wing | 0.49 \pm 0.13 | 0.11 \pm 0.16 | 91 | 61 |
| | Tail | 4.93 \pm 0.15 | 0.63 \pm 1.86 | 90 | 61 |
| | Total | 2.51 \pm 0.69 | 0.38 \pm 0.84 | 92 | 61 |

Table A5. Principal components analysis on feather area, insertion length, and total length of wing, tail, and body feathers of rufous-collared sparrows.

| Region | PC1 | | | PC2 | | | Variable | PC1 | | PC2 | |
|--------|------------|-------|-------|------------|-------|--------------|------------------|-------------|----------------|-------------|----------------|
| | Eigenvalue | % | p | Eigenvalue | % | P | | Eigenvector | Loading Matrix | Eigenvector | Loading Matrix |
| Wing | 1.67 | 55.58 | 0.001 | 0.97 | 32.29 | 0.001 | Feather Area | 0.27 | 0.36 | 0.94 | 0.92 |
| | | | | | | | Insertion length | 0.66 | 0.85 | -0.33 | -0.33 |
| | | | | | | | Total length | 0.69 | 0.90 | -0.05 | -0.05 |
| Tail | 1.58 | 52.56 | 0.001 | 0.97 | 32.47 | 0.001 | Feather Area | 0.33 | 0.41 | 0.90 | 0.88 |
| | | | | | | | Insertion length | 0.63 | 0.79 | -0.43 | -0.42 |
| | | | | | | | Total length | 0.69 | 0.87 | -0.03 | -0.03 |
| Body | 1.78 | 59.52 | 0.001 | 0.84 | 28.08 | 0.001 | Feather Area | 0.57 | 0.76 | -0.59 | -0.54 |
| | | | | | | | Insertion length | 0.48 | 0.64 | 0.79 | -0.73 |
| | | | | | | | Total length | 0.66 | 0.88 | -0.06 | -0.06 |