Morphometrics and weights of birds in the Free State, South Africa

Grzegorz Kopij

Department of Biology, National University of Lesotho, PO Roma 180, Lesotho; g.kopij@nul.ls

Introduction

Most measurements of southern African birds have been taken from living, but not sexed, birds caught for ringing. As a result, there is a lack of morphometric data distinguishing between males and females (Maclean 1993). For example, no such data is available for the Blacksmith Plover and Spotted Dikkop. Little is also known about regional variations in measurements for most species in southern Africa (Brown *et al.* 1982, Urban *et al.* 1986) and about the correlation between measurements of main body parts. This article describes the results of an investigation of the morphology of 154 birds of five species.

Material and methods

Most of the birds were obtained from the airport at Bloemfontein during the years 1993–96. Starlings were shot near Excelsior, eastern Free State, during winter 1993 (*cf.* Kopij in press). Birds were sexed by gonadal examination. Body weight was determined to the nearest gram using a Soehnle battery balance. The following measurements were taken – the wing-length: from the carpal joint to the end of the longest primary feather; tail-length: from the base of the tail to the longest rectrices; tarsus (tarsometatarsus)-length: from the tarsal joint to the base of the foot; culmen-length: from the unfeathered base of the beak to its tip.

The t-test was used to determine the significance of the differences between means of male and female measurements and weights.

Results

Whitewinged Korhaan *Eupodotis afroides* (Table 1)

The Whitewinged Korhaan shows quite obvious sexual dimorphism. In males the bell, neck and much of the head are black, while in females only the bell is black. Males are also significantly heavier than the females ($p = 0.04$), and have longer culmens ($p = 0.04$) and wings ($p = 0.06$). Kok & Van Zyl (1996) have also found significant differences in the body weight between male and female White-

Table 1. Measurements and weights of the Whitewinged Korhaan in the central Free State.

Sex	Value	Wing	Tail	Tarsus	Culmen	Weight
Male (M)	Minimum	238.0	116.0	90.0	33.0	730.0
	Maximum	308.0	136.0	102.0	44.0	942.0
	Mean	283.1	128.6	95.0	38.4	781.7
	SD	13.2	6.3	2.9	3.3	192.3
	N	21	19	21	20	20
Female (F)	Minimum	265.0	121.0	84.0	31.0	732.0
	Maximum	285.0	142.0	95.0	41.0	910.0
	Mean	277.3	130.9	90.2	36.4	790.1
	SD	6.0	6.2	3.8	3.1	45.7
	N	15	15	15	15	15

Table 2. Measurements and weights of the Blacksmith Plover in the central Free State.

Sex	Value	Wing	Tail	Tarsus	Culmen	Weight
Male (M)	Minimum	197.0	84.0	67.0	25.0	152.0
	Maximum	225.0	96.0	82.0	34.0	192.0
	Mean	215.6	89.5	74.8	30.0	169.4
	SD	13.0	3.1	3.8	2.1	14.2
	N	25	25	26	25	26
Female (F)	Minimum	192.0	81.0	64.0	27.0	142.0
	Maximum	230.0	98.0	79.0	34.0	188.0
	Mean	213.2	89.9	72.1	29.6	164.8
	SD	7.4	3.8	3.7	2.1	11.6
	N	33	31	30	32	32

Table 3. Measurements and weights of the Spotted Dikkop in the central Free State.

Sex	Value	Wing	Tail	Tarsus	Culmen	Weight
Male (M)	Minimum	227.0	107.0	91.0	35.0	416.0
	Maximum	250.0	128.0	107.0	42.0	536.0
	Mean	240.9	120.9	98.4	38.6	487.8
	SD	7.3	6.5	5.4	2.0	39.1
	N	10	9	8	9	10
Female (F)	Minimum	230.0	117.0	89.0	35.0	410.0
	Maximum	248.0	131.0	112.0	43.0	544.0
	Mean	239.0	121.3	97.1	38.8	476.0
	SD	6.3	4.2	6.4	2.5	41.6
	N	10	10	10	10	10

winged Korhaans breeding in the Free State. The tail- and tarsus-lengths remain much the same in both sexes ($p = 0.14$ and 7.73 respectively). The wing- and tarsus-lengths increase when body weight increases. The tail-length is not correlated with the wing-length and the culmen-length is not correlated with the tarsus-length.

Blacksmith Plover *Vanellus armatus* (Table 2)

In the Blacksmith Plover only the tarsus-length is significantly longer in males than in females ($p = 0.004$). This study found statistically significant sexual differences in the body weight of Blacksmith Plovers. Kok & Van Zyl (1996) found similar differences in their study of Free State Blacksmith Plovers. No correlation between the increase in the body weight and the wing- and tarsus-length is noticeable. The tail-length increases with the wing-length, and the culmen-length increases with the tarsus-length.

Table 4. Measurements of the Pied Starling in the central Free State (male & female).

Value	Wing	Tail	Tarsus	Culmen
Min.	14.7	9.3	3.6	2.1
Max.	15.9	10.3	4.1	2.9
Mean	15.4	9.7	3.9	2.3
SD	0.4	0.3	0.1	0.2
N	15	15	15	14

Spotted Dikkop *Burhinus capensis* (Table 3)

No statistically significant sexual differences in measurements and weights were found between male and female Spotted Dikkop. With increasing body weight, wing-length

Table 5. Measurements and weights of the Wattled Starling wintering in the central Free State.

Sex	Value	Wing	Tail	Tarsus	Culmen	Weight
Male (M)	Minimum	11.5	6.5	2.9	2.1	75.0
	Maximum	12.2	7.2	3.2	2.4	88.0
	Mean	11.9	6.9	3.0	2.2	82.0
	SD	0.2	0.2	0.1	0.1	4.3
	N	8	8	8	8	8
Female (F)	Minimum	11.2	6.6	2.8	2.1	66.0
	Maximum	12.4	7.1	3.0	2.3	76.0
	Mean	11.7	6.9	2.9	2.2	71.7
	SD	0.5	0.2	0.1	0.1	4.2
	N	7	7	7	7	7
Unsexed	Minimum	11.0	6.5	2.7	2.1	–
	Maximum	12.2	7.5	3.1	2.4	–
	Mean	11.6	6.8	2.9	2.3	–
	SD	0.4	0.4	1.1	0.1	–
	N	10	10	10	10	–

decreases, and the tarsus-length increases slightly. The tarsus-length is slightly correlated with the culmen-length, but a correlation is not obvious between the tail- and the wing-length. Kok & Van Zyl (1996) did not record any statistically significant differences between the weights of 63 males and 24 females.

Pied Starling *Spreo bicolor* (Table 4)

Measurements of only 14 Pied Starlings were taken, and the birds were not sexed. Kok & Van Zyl (1996) have recorded statistically significant differences in the body weights between males and females Pied Starlings.

Wattled Starling *Creatophora cinerea* (Table 5)

No statistically significant differences between male and female measurements and weights were found between non-breeding males and females Wattled Starling. Kok & Van Zyl (1996) also did not record statistically significant differences in the body weight between male and female Wattled Starlings.

References

Brown, L.H., Urban, E.K. & Newman, K. 1982. The birds of Africa. Vol. 1. London: Academic Press.

Kok, O.B. & Van Zyl, J.M. 1996. Body mass of birds from central South Africa. Ostrich, 67: 160–162.

Kopij, G. in press. Extension and intensity of tick and lice infestation in birds in the Free State, South Africa. Zimbabwe Veterinary Journal.

Maclean, G.L. 1993. Roberts' birds of southern Africa. Cape Town: John Voelcker Bird Book Fund.

Urban, E.K., Fry, C.H. & Keith, S. 1986. The birds of Africa. Vol. 2. London: Academic Press.

Editor's note

More weights are listed in:

Herholdt, J.J. 1988. Bird weights from the Orange Free State. Part I: Non-passerines and Part II: Passerines. Safring News 17: 3–14 and 43–57.