



Reproductive tract morphology of farmed common eland (*Tragelaphus oryx*) bulls, and their relationship with secondary sexual traits and social rank

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1. Introduction

- ❖ Popular game species in southern Africa for trophy hunting & meat production (Taylor et al., 2020)
- ❖ Distributed internationally due to its production potential (high carcass yield & meat quality) (Needham et al., 2022)



- ❖ Recommended for domestication as an alternative farming species due to its adaptability & temperament (Barton et al., 2014)
- ❖ In Europe, production was practised as early as 1892 & currently, farmed for meat, albeit at a small scale (Treus and Lobanov, 1971)

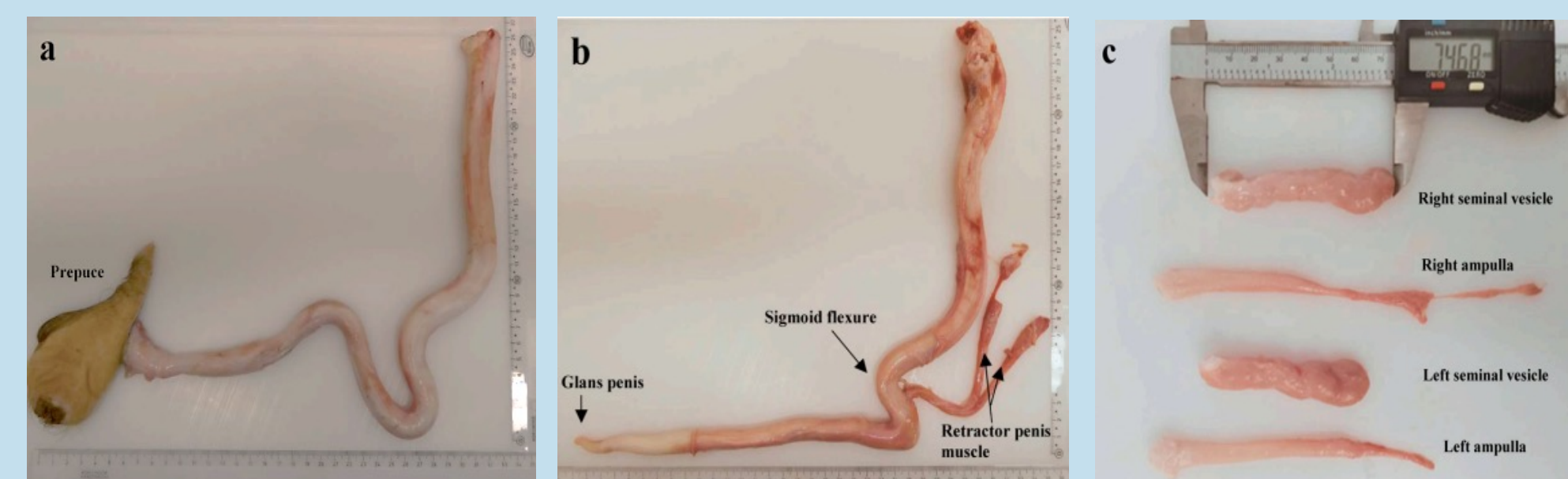
*Limited information on their intensive management, including scientifically based selection criteria for breeding bulls

AIM: Provide basic information of common eland bulls' reproductive morphology, symmetry, and their relationships with a range of animal characteristics often used as markers in selecting bulls for breeding.

2. Materials and Methods

Culling of 6 eland males (2–2.5 years old; 203 ± 20 kg) at FTZ Research Facilities

Dissection & reproductive tract size measurements of both left & right bilateral organs



CIE Lab colour of cut testicular cross-sections & tissue histology evaluation



Statistical analyses: Shapiro-Walk test; Paired-student t-test, Descriptive statistics, Pearson correlations, Heatmaps (ggplot R package)

3. Results and Discussion

Table 1. Morphological measurements of the reproductive tract of common eland bulls (n=6) and their symmetry

Reproductive tract morphology	Mean ± SD	c.v. %	L-R comparison
Penis length (cm)	27.92 ± 3.11	11.1	
Penis + prepuce + sigmoid flexure weight (g)	150.92 ± 28.01	18.6	
Penis + prepuce + sigmoid flexure length (cm)	53.67 ± 9.60	17.9	
Ampulla weight (g)	3.46 ± 1.19	34.5	t=0.104; p=0.921
Ampulla length (mm)	86.57 ± 25.65	29.6	t=-0.450; p=0.672
Seminal vesicle weight (g)	6.49 ± 1.71	26.4	t=0.607; p=0.570
Seminal vesicle length (mm)	50.09 ± 14.51	25.0	t=0.887; p=0.715
Prostate gland weight (g)	0.53 ± 0.25	47.6	
Prostate gland length (mm)	56.21 ± 41.15	73.2	
Cowper's gland weight (g)	2.43 ± 2.55	104.9	
Scrotal weight (g)	210.98 ± 34.77	16.5	
Testes weight (g)	42.67 ± 5.37	12.6	t=1.284; p=0.255
Testes length (mm)	55.23 ± 5.03	9.1	t=1.590; p=0.173
Testes width (mm)	33.43 ± 2.17	6.5	t=-0.844; p=0.417
Gonadosomatic index (%)	0.072 ± 0.01	18.1	
Seminiferous tubules thickness (µm)	32.43 ± 3.25	10.0	t=1.485; p=0.188
Seminiferous tubules circumference (µm)	325.76 ± 26.58	8.2	t=1.105; p=0.311
Epididymis weight (g)	10.01 ± 1.47	14.7	t=0.237; p=0.822
Epididymis length (mm)	108.33 ± 8.99	8.3	t=0.237; p=0.822
Testes colour			
*L	65.34 ± 1.35	2.1	t=0.630; p=0.556
*a	2.55 ± 0.68	26.6	t=0.938; p=0.391
*b	13.18 ± 0.75	5.7	t=0.047; p=0.964

L-left; R-right; c.v. % = coefficient of variation percentage

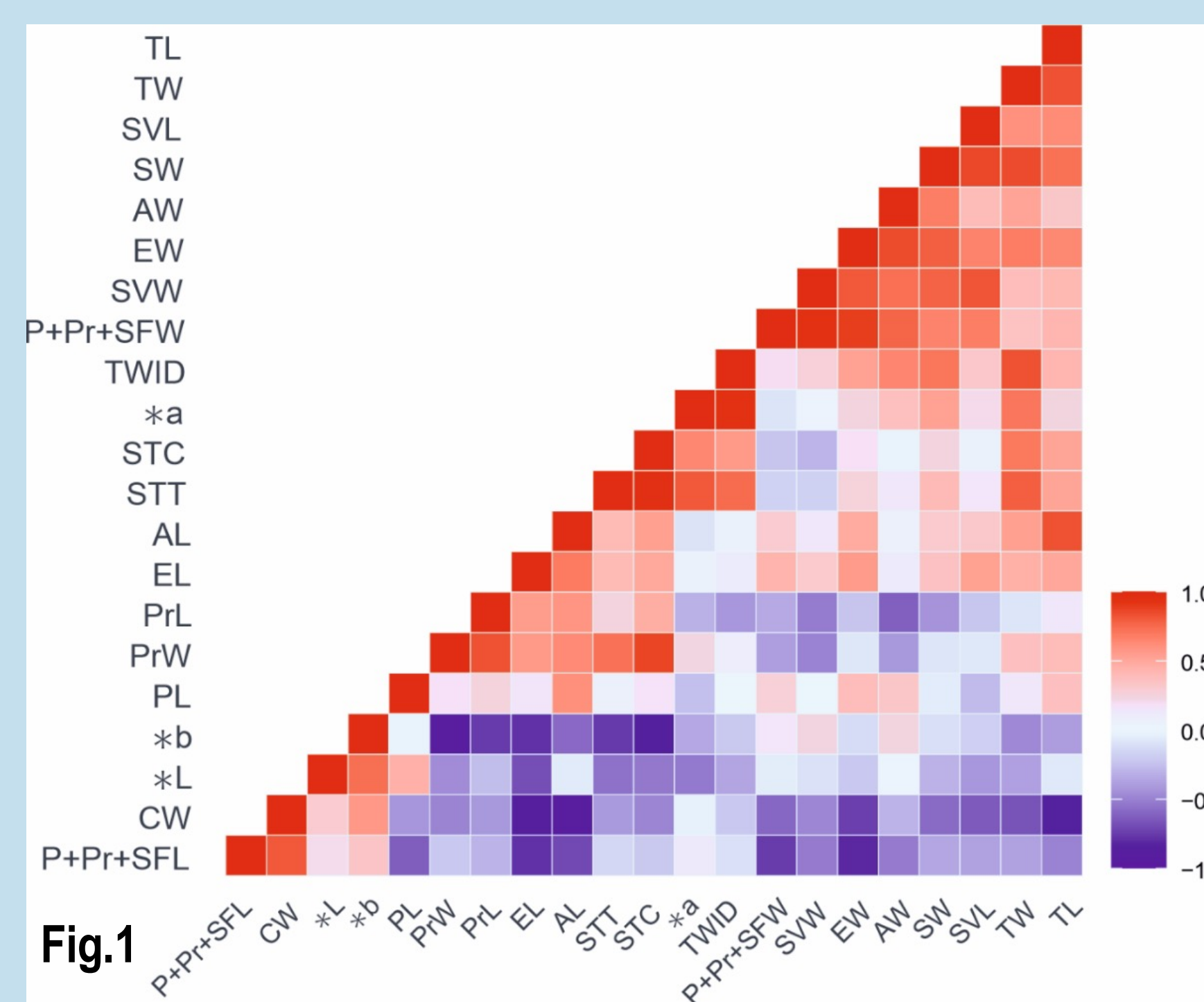


Fig.1

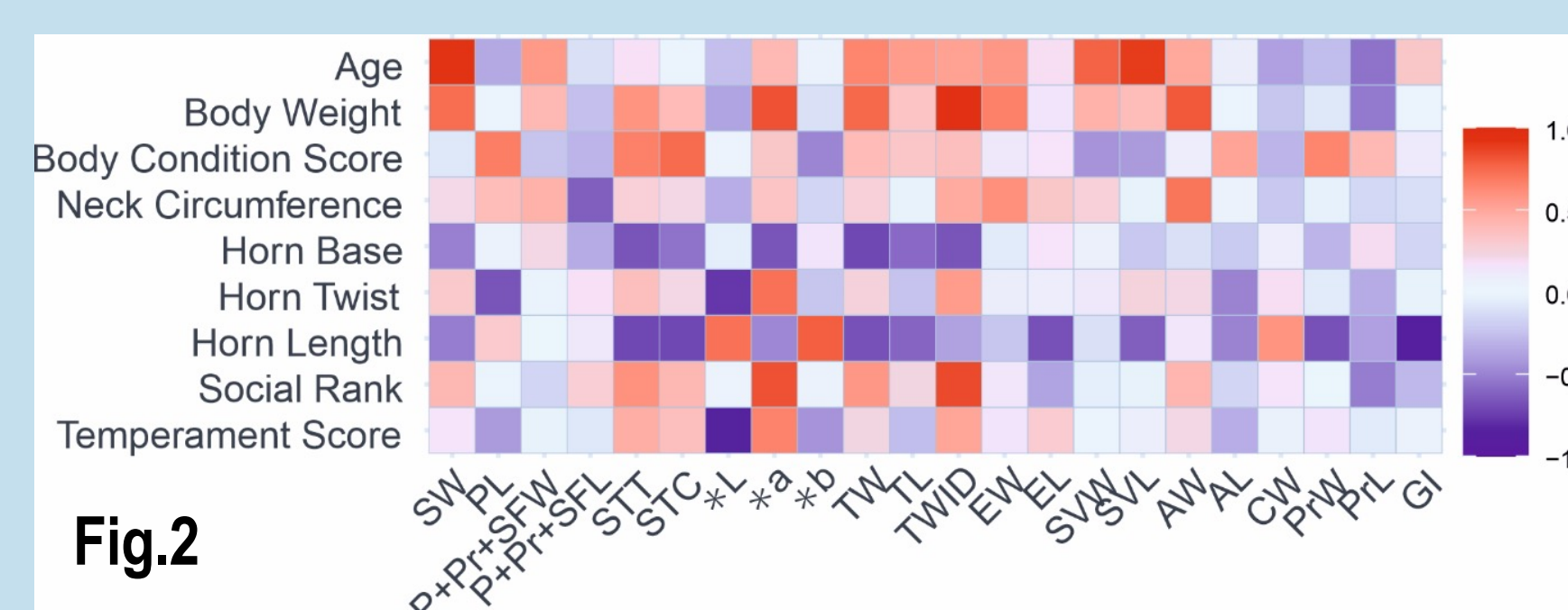


Fig.2

Fig. 1 and 2: Heat maps illustrating the Pearson correlations among the reproductive tract morphological characteristics and different animal traits of common eland bulls. Red to purple colouration of the boxes indicates negative and positive correlations (r values between 1 to -1) with the following variables: Penis sheath length (P+Pr+SFL); Ampulla weight (AW); Ampulla length (AL); Seminal vesicle weight (SVW); Seminal vesicle length (SVL); Prostate weight (PrW); Prostate length(PrL); bulbourethral gland weight (BuW); Scrotal weight (SW); Testes weight (TW); Testes length (TL); Testes width (TWID); Seminiferous tubule thickness (STT); Seminiferous tubule circumference (STC); Epididymis weight (EW); Epididymis length (EL); Lightness (*L); redness (*a); and yellowness (*b)

- Morphologically similar reproductive tract to cattle.
- Relatively low asymmetry in bilateral reproductive tract components.
- Age, body weight, and social rank positively correlates with the development of some testicular morphologies.
- Correlations between horn length, temperament, and reproductive tract development were rather negative at this age.

4. Conclusion

Age, body weight, and social rank may be used as possible selection criteria for common eland breeding bulls, but horn length and temperament should be further considered at this stage of development.

