

SHORT REPORT

Sheep (*Ovis aries*) of Venda speakers during the second millennium AD in South Africa

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Email: shaw.badenhorst@wits.ac.za**Abstract**

Little remains known about the physical size of local sheep from southern Africa during the distant past. Early Venda speakers settled in the region during the middle of the second millennium AD, and an early site associated with them, Mutokolwe B, yielded 11 complete metapodia of sheep. This is the largest find of this nature in the southern African region for farming communities. The fauna from Mutokolwe B dates to between AD 1450 and 1550. Measurements of archeological sheep bones can help tease apart questions of breed development and socio-economic organization in the past. We used these metapodials to calculate the shoulder height of sheep. Sheep from Mutokolwe B ranged between 61.69 and 71.17 cm in shoulder size (average 66.28 cm), which is similar to other local sheep breeds such as the Nguni found in South Africa. In addition, the size of the sheep from Mutokolwe B falls within the variation of modern sheep found in southern and Eastern Africa.

KEYWORDS

caprines, environment, farmers, osteometry, Soutpansberg, withers height

1 | INTRODUCTION

Osteometrical studies remain an important avenue of research in zooarchaeology across the world. These studies provide information on aspects such as the evolution of species, animal domestication, sexing, and aging bones as well as environmental impacts that affect body size (Gifford-Gonzalez, 2018; von den Driesch, 1976). In West Africa, for example, the stature of domestic animals has been used to infer herd mobility and animal husbandry practices. In this region, recent studies have shown a relationship between size and mobility in sheep. Smaller sheep are kept by sedentary farmers in relatively humid environments with generalized economic strategies, whereas larger sheep are well suited for specialized, mobile pastoral lifeways in arid environments whose primary subsistence labor relates to livestock (Linseele, 2007; Stone, 2018). These studies found that livestock of smaller stature, such as dwarf sheep and goats, cannot travel for more than a few days consecutively and require water every day. Larger

breeds, however, may travel for 3 or 4 months consecutively, only requiring water after 3 or 4 days. Dwarf breeds are therefore of little use to migrating Sahelian pastoralists, which are only kept by sedentary farmers in well-watered and forested zones (MacDonald, 1995). By 2000 BC, dwarfing in livestock occurred in West Africa, most likely related to the appearance of breeds tolerant of trypanosoma. By 400 AD, larger breeds of sheep and goats appear in the region, and these could represent animals traded from nomadic pastoralists groups on seasonal visits to the Niger Delta (MacDonald & Hutton MacDonald, 2000).

Sheep (*Ovis aries*) are today one of the most important farm animals in the southern African region (e.g., Ramsay et al., 2000). During the last two millennia, pastoralists and farmers brought sheep to the region along with the major other domesticates: cattle, goats, chickens, and dogs (Plug & Voigt, 1985; Robbins et al., 2005, 2008). During the first and early half of the second millennium AD (AD 200–1300), caprines (sheep and goats collectively) dominate faunal

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assemblages from southern Africa (Badenhorst, 2011; Fraser & Badenhorst, 2014), of which sheep generally outnumber goats (*Capra hircus*) (Badenhorst, 2018). This changed during the middle to later part of the second millennium AD (AD 1300–1820s), when cattle became the most important domesticated (Badenhorst, 2010). Recent descriptions of sheep kept by farmers indicate that they were generally short-legged with long hair instead of wool (Schapera & Goodwin, 1953, p. 131; van Zyl, 1972, p. 87; Plug, 1996). Sheep have the ability to remain fat even under times of hardship (van Zyl, 1972, p. 87). It is generally accepted that in the past, they probably had fat tails and had hair, rather than wool (e.g., Plug, 1996), similar to other breeds found in many parts of Africa today (Hailey, 1957). The presence, however, of sheep with thin tails in rock art from Zimbabwe (Manhire et al., 1986) suggests the possibility of both varieties in the region during the past.

Today, there are three broad varieties of sheep in Africa. These are, first, the primitive fat-rumped, fat-tailed hair type found in eastern and southern Africa. Second, the thin-tailed hair variety is found in western Africa, and, third, thin-tailed woolled sheep are located in northern Africa (Ryder, 1983, p. 551). Dwarf sheep are common in tropical zones of West Africa with a shoulder height of less than 50 cm (Epstein, 1971). The major local sheep breeds found today in South Africa include the Blinkhaar Ronderib Afrikaner, Damara, Namaqua Afrikaner (today all associated with pastoralists), the Nguni and Pedi (today both associated with African farmers and the latter often regarded as a variety of the Nguni) (Ramsay et al., 2000). However, Epstein (1971) mentions the presence of four local sheep in the northern parts of South Africa and adjacent areas, namely the Landim (from Mozambique), Venda (recently only found in the mopani veld

north of the Soutpansberg), Pedi, and Tswana. Nevertheless, sheep kept by pastoralists in South Africa are often larger than those associated with farmers, notwithstanding issues about stock improvement. For example, the Namaqua Afrikaner has a shoulder height of 74 cm (Qwabe, 2011), whereas Nguni sheep have a shoulder height of 61–63 cm (Oosthuizen, 2018), and the Pedi a shoulder height of 60 cm (Epstein, 1971). This may suggest that a similar distinction is possible in sheep sizes between pastoralists and farmers like in West Africa from the last two millennia in southern Africa. This aspect awaits further investigation.

During the second millennium AD, Venda-speaking farmers settled in the far northern corner of South Africa. They settled the region by the AD 1500s (Hanisch, 1994; Huffman, 2007; Loubser, 1989). The origins of Venda speakers are disputed, but it is apparent that they migrated from territories to the north of South Africa (Magoma, 2014). Similarly, the origin of their sheep remains uncertain. Today, the sheep kept by Venda speakers have narrow bodies and long legs with a hairy coat. The tail is long, fat, and straight. Most of these sheep are polled and lack horns (Stayt, 1931, p. 44; Epstein, 1971, p. 138). Female adult ewes of Pedi sheep, found just south of the Soutpansberg Mountains, usually measure 60 cm at shoulder height (Epstein, 1971). Their tails are moderately long, and their colors include black, white, or brown with various patterns (Ryder, 1983, p. 562).

Recently, analyses of the fauna from Mutokolwe B, and early Venda-speaking settlement, revealed complete sheep metapodia. Complete long bone specimens from livestock are virtually absent from the farming community faunal assemblages of southern Africa (Badenhorst & Magoma, 2019; Magoma et al., 2018). These complete

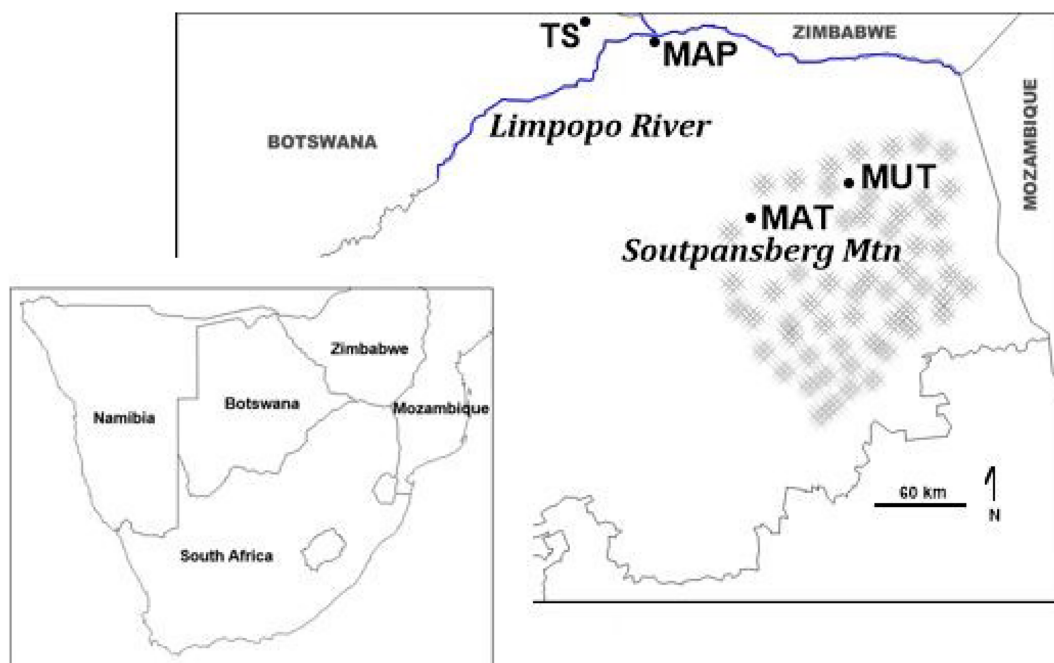


FIGURE 1 Location of Mutokolwe B and other sites mentioned in South Africa. The sourveld (current distribution) is indicated in shaded gray. MAP, Mapungubwe; MAT, Mutamba; MUT, Mutokolwe B; TS, Toutswe [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com)]

TABLE 1 Shoulder height of sheep metapodia from Mutokolwe B (mm)

Square, layer	Element	Side	GL	BP	Factor 1	Factor 2	Factor 3	Shoulder height range (Ave)
A4, 2	Metacarpal	R	145.55	25.27	4.84	4.85	4.89	704.46–711.74 (707.37)
A4, 2	Metacarpal	R	139.65	24.38	4.84	4.85	4.89	675.91–682.89 (678.70)
A1, 4	Metacarpal	R	143.35	23.54	4.84	4.85	4.89	693.81–700.98 (696.68)
B1, 4	Metacarpal	R	137.14	22.81	4.84	4.85	4.89	663.76–670.61 (666.04)
A2, 6	Metacarpal	R	135.19	24.19	4.84	4.85	4.89	654.32–661.08 (657.02)
B4, 6	Metacarpal	L	141.00	23.47	4.84	4.85	4.89	682.44–689.49 (685.26)
B4, 6	Metacarpal	R	132.98	24.70	4.84	4.85	4.89	643.62–650.27 (646.28)
B4, 7	Metacarpal	R	130.00	21.63	4.84	4.85	4.89	629.20–635.70 (631.80)
A3, 10	Metacarpal	L	140.32	22.00	4.84	4.85	4.89	679.15–686.16 (681.95)
B2, 11	Metatarsal	R	136.79	-	4.51	4.54	4.55	616.92–622.39 (620.11)
B4, 12	Metatarsal	R	152.56	20.96	4.51	4.54	4.55	688.05–694.15 (619.61)
Range								616.92–711.74 (662.80)

Note: Factor 1 is from von den Driesch and Boessneck (1974), Factor 2 from Haak (1965), and Factor 3 from Teichert (1975).

Abbreviations: BP, proximal breadth; GL, greatest length.



FIGURE 2 Greatest length (GL) measurement points for sheep metapodia [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.com)]

metapodia from Mutokolwe B allow us to provide stature measurements for sheep during the second millennium AD of southern Africa.

2 | MUTOKOLWE B

Mutokolwe B is a farming settlement located along the Soutpansberg Mountains in South Africa (Magoma, 2014; Figure 1). The Tshiendeulu-Kwevho, part of the Venda-speaking group, claimed they built Mutokolwe B (Loubser, 1989, p. 5). The site may have been a

capital occupied by a chief, with some 1,000 to 2,000 people residing around it (Huffman, 2007; Huffman & Hanisch, 1987). The excavations found typical features associated with Venda speakers, including an audience chamber, a beer drinking hut, a cooking hut, and a messenger hut. The faunal remains were retrieved from the main midden, called Trench I, which measured 3 × 4 m. The midden was excavated in arbitrary layers of 10 cm each, reaching a depth of 2 m. The excavator used a 2 mm mesh size. The radiocarbon date of AD 1450 and AD 1550 confirmed the early age of the settlement. Other finds include Khami-style pottery, spindle whorls, copper and iron bangles, shell, ivory bangle fragments, and glass and land snail beads (Fish, 2000).

The fauna from Mutokolwe B is dominated by cattle remains, followed by caprines, with almost no evidence for hunting (Magoma et al., 2018). Cattle also dominate other settlements associated with Venda speakers (de Wet-Bronner, 1994, 1995a, 1995b, 1997, but see Raath Antonites & Kruger, 2012, for a very recent sample). The fauna from the site is unique; eight complete metacarpals and five complete metatarsals of cattle were found, which provided a shoulder height range of 106.90 to 129.49 cm, the most ever discovered at any farming settlement in southern Africa (Badenhorst & Magoma, 2019). It is possible that this rare find could signal feasting activities (Magoma et al., 2018). The faunal remains from Mutokolwe B have also yielded the most complete number of sheep metapodia ever reported from the entire period of farming occupation of southern Africa, and we use these to calculate the shoulder height of sheep at the site.

3 | RESULTS

Mutokolwe B yielded nine complete metacarpals, and two metatarsals of sheep (Supporting Information S1). Most specimens are right sided and distinguishable from goats (see Badenhorst, 2006). Different studies have established factors used to calculate the shoulder height of sheep based on different European breeds (Haak, 1965;

TABLE 2 Sheep astragali sizes (using the greatest length) used for shoulder height calculation (mm)

Square, layer	Element	Side	GL	Factor 1	Factor 2	Factor 3	Shoulder height range (Ave)
A2, 3	Astragalus	L	26.00	19.24	20.95	22.68	500.24–589.68 (544.87)
A4, 3	Astragalus	L	28.58	19.24	20.95	22.68	549.88–648.19 (598.94)
A2, 4	Astragalus	L	27.45	19.24	20.95	22.68	528.14–622.57 (575.26)
A3, 4	Astragalus	R	27.66	19.24	20.95	22.68	532.18–627.33 (579.66)
A4, 4	Astragalus	R	28.81	19.24	20.95	22.68	554.30–653.41 (603.76)
B4, 11	Astragalus	R	29.06	19.24	20.95	22.68	559.11–659.08 (609.00)
Range							500.24–659.08 (585.25)

Note: The factors are from Teichert (1975).

FIGURE 3 Shoulder height comparisons of Mutokolwe B sheep metacarpals and astragali (mm) showing the minimum and maximum values, the upper and lower quartiles and the average

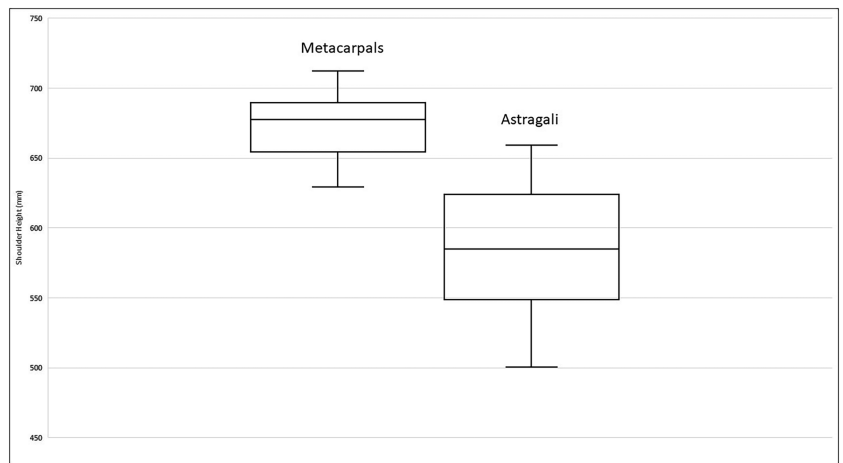
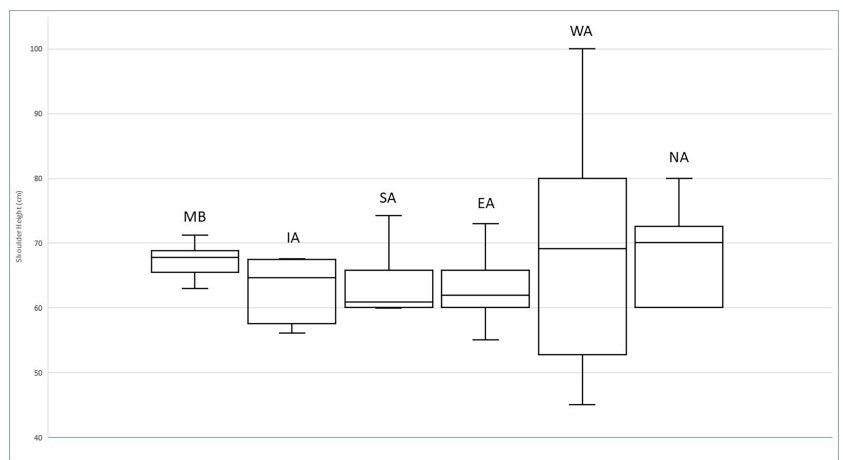


FIGURE 4 Shoulder height comparisons of sheep metacarpals from Mutokolwe B (MB), the Iron age of southern Africa (IA), and modern breeds from southern (SA), eastern (EA), western (WA), and northern Africa (NA). Averages used (cm) showing the minimum and maximum values, the upper and lower quartiles, and the average [Colour figure can be viewed at wileyonlinelibrary.com]



Teichert, 1975; von den Driesch & Boessneck, 1974). While taking into account that the application of shoulder height data of European breeds of sheep may be a limiting factor, such research has not been done for African or, specifically, southern African breeds (cf. Badenhorst, 2006). As a result, we applied them to our sample of fused, adult specimens (Table 1; Figure 2). Our results indicate that sheep are usually less than 70 cm at shoulder height but generally

range between 61.69 and 71.17 cm with an overall average of 66.28 cm.

We used the greatest length of all complete sheep astragali from the Mutokolwe B sample to calculate shoulder height as a proxy for the metapodia (Table 2; Figure 3). The astragali provided a lower shoulder height for sheep at Mutokolwe B, ranging between 50.02 and 65.90 cm, with an average of 58.51 cm. The lower shoulder

height values obtained from the astragali may be due to the inclusion of immature specimens, and we regard the shoulder height data based on the metapodia as a more accurate reflection of the shoulder height of sheep at Mutokolwe B.

4 | DISCUSSION AND CONCLUSION

Little remains known about the sizes of livestock from southern Africa during the past (but see for cattle and goats in particular Abatino, 2021; Badenhorst & Magoma, 2019; Badenhorst & Plug, 2003; Beukes, 2000; de Wet-Bronner, 1997; Hutten, 2005; Plug & Badenhorst, 2002; Voigt, 1983). Due to the almost complete lack of intact long bones of sheep at farming sites in southern Africa, comparative data on sheep from the last two millennia are almost completely absent. However, those studies that provided data on shoulder height of sheep in southern Africa (Supporting Information S2) show that at Toutswe and Mapungubwe (both early second millennium AD sites), the shoulder height for sheep is similar to that obtained from Mutokolwe B (dating from the middle of the second millennium AD). This may suggest a similar origin for sheep found among farmers from the second millennium AD or continuity in the presence of specific sheep breeds in the region. However, the shoulder heights based on astragali obtained from the early second millennium AD site of Mutamba is generally lower. A lower shoulder height for cattle (Badenhorst & Magoma, 2019) was also obtained from astragali at Mutokolwe B compared to the metapodia (also see von den Driesch & Boessneck, 1974). As indicated already, this may be due to the inclusion of bones from immature individuals. Nevertheless, the sheep from the second millennium AD in southern Africa is smaller than those found, for example, at Kerma in Sudan, where sheep have an average shoulder height of approximately 80 cm (Chaix & Grant, 1987). The sheep from Mutokolwe B, standing between 61.69 and 71.17 cm at shoulder height, falls within the variation of other local sheep breeds from southern and eastern Africa (Supporting Information S3; Figure 4). The local sheep of southern Africa likely originated from Eastern Africa (Epstein, 1971).

The shoulder height of livestock like sheep is influenced by factors such as breed, local environmental conditions, diet, and sexual dimorphism (e.g., Reitz & Wing, 2008). A modern study of shoulder heights of cattle kept by Venda speakers shows the influence of the local environment on livestock sizes. Cattle from local sweet-veld grazing areas have a higher shoulder height (139 cm for oxen and 124.3 to 126.2 cm for cows), while those from mixed-veld grazing is smaller (130 to 136 cm for oxen and 121 cm for cows), while those from sour-veld measured are even smaller in stature (117.2 to 118.9 cm for cows; Mansvelt & Skinner, 1962, pp. 5–7). Mutokolwe B is located in the sour-veld environment (Acocks, 1953) which could have influenced the size of sheep. However, people could also have grazed in or otherwise obtained their sheep flocks from other environments. The size of sheep is also affected by sex. Female sheep tend to be slightly smaller in stature than males (Davis, 2000). It is very likely

that those individuals on the lower end of the scale in terms of shoulder height at Mutokolwe B are females and those on the higher end males.

While the sheep sample of complete metapodia is small from Mutokolwe B, the results nonetheless provide important information on the physical stature of these animals during the middle of the second millennium AD. The similarity in shoulder height between sheep from Mutokolwe B, those from other farming sites, and modern breeds supports the notion that sheep from southern Africa originated from eastern Africa (Epstein, 1971). The differences in sheep associated with pastoralists today, which are larger in size than those associated with farmers, may extend back and time and remains a topic for future research. As more samples of sheep are studied, the physical stature of this important domestic animal will be receive further attention. The use of the log scale index (Meadow, 1999) may be useful in such broader, multi-site comparisons in the region.

ACKNOWLEDGMENTS

The authors are thankful for funding from the National Research Foundation (NRF), the Department of Arts and Culture and the South African National Parks (SANParks). The Ditsong National Museum of Natural History allowed access to their collections. We thank the Tshiendeulu chieftaincy for allowing the study of the faunal remains from Mutokolwe. The reviewers of this paper provided constructive suggestions; however, any oversight remains our responsibility. Open access funding enabled and organized by Projekt DEAL.

CONFLICT OF INTEREST

The authors have no conflict of interest to report.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available in the supporting information of this article.

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How to cite this article: Badenhorst, S., & Magoma, M. (2022). Sheep (*Ovis aries*) of Venda speakers during the second millennium AD in South Africa. *International Journal of Osteoarchaeology*, 32(4), 944–950. <https://doi.org/10.1002/oa.3115>