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Relative preference for, palatability and intake of *Stylosanthes scabra* accessions adapted in Pretoria

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Introduction

Inadequate supply and quality of forage, particularly during the dry season, is a major constraint to livestock production in sub-Saharan Africa (Anele et al. 2011), including South Africa. Poor management of the available feeds, seasonal variability in weather and climate change contribute to the high fluctuation of forage quality and quantity between seasons and years (Sultan et al. 2008). To improve livestock production, there is a need to improve both quantity and quality of available feed through the use of alternative forage crops.

Stylosanthes scabra cv. Seca has been evaluated for dry season feed supplementation, and was found to be adapted to and productive in the subtropical climate of Gauteng Province (Mpanza et al. 2013). The objective of this study was to determine the preference for, and palatability and intake of forage from 5 different *Stylosanthes scabra* accessions offered to Saanen goats.

Materials and Methods

Five accessions of *S. scabra* from the ILRI genebank: ILRI Nos. 9281, 11252, 11255, 11595 and 11604, were grown in Pretoria and their forage, 10 weeks old and at 100% flowering, offered to 5 Saanen goats (48.7 ± 2.78 kg) that were individually housed in 8-m^2 pens. Following a 10-day adaptation period, forage consumption data were collected for 5 consecutive days. Each animal was offered fresh branches of the 5 forages, mounted on a foraging board in a cafeteria system, for 30 minutes/day.

Forages were weighed before and after being browsed by the goats to estimate daily intake (on dry matter basis), and a relative preference index (RPI) was calculated as described by Larbi et al. (1993). Chemical composition, plant secondary metabolites, in vitro organic matter digestibility and gas production characteristics were determined using standard procedures. The data were analyzed by GLM procedure of SAS and, where F value showed a significant difference at $P<0.05$, means were separated using Duncan's multiple range test.

Results and Discussion

The chemical composition and digestibility of the 5 *Stylosanthes scabra* accessions are presented in Table 1. The accessions generally did not differ in terms of crude protein (CP), in vitro organic matter digestibility (IVOMD) and gas production at 24 and 48 hours. While there were marked differences between accessions for neutral detergent fiber (NDF) and total extractable tannins (TET), differences were not statistically significant. There was significant variation in terms of total extractable phenols (TEP) and ash content. The CP concentration of all forages was well above the critical level (8%) that supports normal intake and rumen functioning (Ikhimioya 2008), and NDF was below the upper limit of 60% (Meissner et al. 1991) that limits forage intake by the animal. Similarly, the tannin concentrations were lower than the critical level (9%) that affects digestion and intake by goats (Nastis and Malachek 1981). Despite the foregoing, there were significant variations ($P<0.01$) between accessions in terms of average daily forage intake and relative palatability index (RPI) (Table 2).

All accessions were browsed by the goats and thus were acceptable and palatable to animals. However, intake of accession ILRI 11604 was highest, and those of ILRI 11255 and 9281 were the lowest.

Conclusions

The study showed that all *Stylosanthes scabra* accessions tested are acceptable and palatable to goats. While ILRI 11604 and 11595 achieved highest intakes by goats, further studies are required to determine how these preferences are

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Table 1. Forage chemical composition, digestibility and gas production characteristics of 5 *Stylosanthes scabra* accessions.

ILRI accession No.	Chemical composition (g/kg DM)					IVOMD[1] (%)	Gas production (mL/0.2 g DM)	
	CP	Ash	NDF	TEP	TET		G_24	G_48
9281	184.1a[2]	96.9ab	418.7a	1.99d	1.22a	74.22a	80.04a	91.11a
11252	177.5a	93.6ab	439.9a	2.60b	1.02a	71.77a	75.37a	88.43a
11255	182.8a	80.1b	334.3a	2.90a	1.14a	71.61a	76.16a	89.58a
11595	185.4a	94.4ab	483.4a	2.51c	1.64a	69.83a	78.86a	89.39a
11604	181.7a	102.2a	499.3a	2.04d	0.87a	68.43a	78.71a	89.51a

[1]IVOMD, in vitro organic matter digestibility; CP, crude protein; NDF, neutral detergent fiber; TEP, total extractable phenols; TET, total extractable tannins; G_24 and G_48, gas production after 24 and 48 h, respectively.
[2]Values within columns followed by different letters differ at P<0.05.

Table 2. Daily intake and relative preference index of 5 *Stylosanthes scabra* accessions fed to Saanen goats.

ILRI accession No.	Average daily intake (g DM/d)	Relative preference index (%)
9281	63.4b[1]	40.5b
11252	95.3ab	60.9ab
11255	52.2b	35.5b
11595	112.2ab	67.0ab
11604	139.3a	84.4a

[1]Values within columns followed by different letters differ at P<0.01.

converted into animal product. Factors like dry matter yield are also important in terms of choosing a suitable accession for supplementary feeding.

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