

## ABSTRACT

In South Sudan livestock is an important source of livelihood however, animal productivity is very low due to lack of adequate feed particularly in dry season. In this study five objectives were carried out. In objective 1, a questionnaire survey was conducted amongst livestock keepers and generally 25 most commonly browsed species were identified. The study indicate that, there is a wide range and diversity of browse species that could serve as important livestock feed. The study evaluated 5 species as feed for ruminant livestock and these include; *Acacia nilotica* (An), *Balanites aegyptiaca* (Ba), *Combretum adenogonium* (Ca), *Sclerocarya birrea* (Sb) and *Ziziphus spina-christi* (Zs). Objective 2 assessed the nutritive value of selected indigenous browses. *Combretum adenogonium* and Zs had the highest CP values. The browse species had phenolic and tannin contents higher than 50 g/kg DM, the maximum tolerable limit in ruminant nutrition, except for Ba and Zs, which had significantly ( $P < 0.05$ ) lower total extractable phenols (TEP). The contents of macro and micro elements differed significantly ( $P < 0.05$ ) among the browse species. The means (objective 3) for in vitro gas production ranged from 30.6 to 45 ml/kg DM for 3 and 96 hr, respectively. *Balanites aegyptiaca*, Ca and Zs at 96hr had high gas production potential compared to An and Sb. In vitro OM degradability (OMD) was significantly ( $P < 0.05$ ) different between the browses. *Combretum adenogonium* and *Z. spina-christi* had the highest OMD but not significantly ( $P > 0.05$ ) different to Ba, while An and Sb had lower but similar ( $P > 0.05$ ) OMD values. The highly degradable browses had similar ME values but significantly ( $P < 0.05$ ) higher compared to An and Sb. In objective 4, Ca and Zs were fed to 20 cross-bred goats singly and in combination as supplement to a basal diet of Rhodes grass (*Chloris gayana*) hay. Four goats were allocated randomly to each of the five dietary treatments in a completely randomized design. The dietary ratios were as follows; C0Z100 (D1), C25Z75 (D2), C50Z50 (D3), C75Z25 (D4) and C100Z0 (D5). The dry matter intake (DMI) was significantly ( $P < 0.05$ ) different in all the dietary treatments. Basal diet intake was significantly ( $P < 0.05$ ) high in D5. Higher intake of supplement was observed at high inclusion rate of Zs. Total DMI increased with high inclusion rate of Zs. D1 had significantly high nutrient digestibility. D2 had significantly ( $P < 0.05$ ) higher retention of nitrogen whereas D4 had least retained nitrogen. Live weight gain (g/day) was highest ( $P < 0.05$ ) in D1 and lowest ( $P < 0.05$ ) in D5. In objective 5, sixteen cross-bred goats were assigned randomly to four dietary treatments four goats per treatment in a complete randomized design. The goats were fed graded levels of Zs as follows; 0 (T1), 20 (T2), 30 (T3) and 40% (T4). DMI and digestibility was ( $P < 0.05$ ) high in supplemented diets. More nitrogen was retained in the supplemented treatments, while weight gain was negative in T1 (control). It is concluded that the indigenous forages can provide adequate sources of nutrients to ruminant livestock. The browse fodders play an important role as feed, contributing significant feed resources for livestock particularly as dry season feed when grasses and other quality forages become scare.

### Keywords

Nutritive value -- Indigenous tree browses -- Ruminant livestock