CHEMICAL AND TANNIN COMPOSITION OF BROWSABLE SPECIES USED AS RUMINANT FEED SUPPLEMENTS IN THE VHEMBE DISTRICT OF SOUTH AFRICA

BY

MAHLAKO KGABO TRYPHINA

Student no: 11542045

A dissertation submitted in partial fulfillment of the requirements for the degree of Masters of Science in Agriculture.

Department of Animal Science

School of Agriculture,

University of Venda

SOUTH AFRICA

December 2011.

Supervisor : Dr. J.J. Baloyi
Co-Supervisor : Dr. K. Benyi
ABSTRACT

The chemical and tannin composition of Acacia nilotica, Dichrostachys cinerea and Ziziphus mucronata from high, medium and low rainfall areas were studied. Dry matter and ash, crude protein content, natural detergent fibre and acid detergent fibre were determined. The macro elements were then determined by flame or hydride generation technique and micro using metrolhm Ion Chromatography. The condensed tannins were determined using n-butanol-HCL colorimetric method. The data were analyzed by analysis of variance for a 3 x 3 factorial in a completely randomised design using the General Linear Model (GLM) procedure of SPSS version 19. Averaged overall zones, D. cinerea had a higher ash content than the other two species. Z. mucronata had the highest CP content followed by D. cinerea and A. nilotica. D. cinerea had the highest NDF level followed by A. nilotica and then by Z. mucronata. Trees that grew in the medium rainfall zone had the highest CP level (153 g/kg DM) followed by those that grew in the low rainfall zone whilst those that grew in the high rainfall zone had the lowest CP content (101 g/kg DM). A. nilotica and D. cinerea did not differ in ADF and phosphorus but had higher levels than Z. mucronata (P < 0.01). A. nilotica had a high chlorine content (130 g/kg DM) than the other tree (P <0.01). In addition the high and low rainfall trees had a high fluorine levels than the medium rainfall trees. Z. mucronata trees that grew in low rainfall areas had the highest total tannin content of 382 g/kg Mimosa tannin equivalent. The findings of this study showed that the three forage legumes species are high in condensed tannins but they are of good nutritive value and have potential for integration into ruminant livestock production in Limpopo Province of South Africa.

Keywords: Crude protein, Anti-nutritional, Minerals, Forage legumes, Agro-ecological