

A comparison between *Acacia* and *Combretum* leaves utilized by giraffe

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Various studies on the food preferences of giraffe indicate that the leaves of the *Acacia* and *Combretum* species are the most important food items selected. The present study was aimed at comparing the chemical composition of the leaves and explaining the utilization of both these plant groups by giraffe. The protein content of the leaves of the *Acacia* species is generally higher than in those of the *Combretum* species and they are therefore a better source of food.

Verskeie studies op die voedselvoorkeur en voedselseleksie van kameelperde het aangetoon dat die belangrikste voedsel die blare van die *Acacia* en *Combretum* spesies is. Die doel van hierdie studie is om die chemiese samestelling van die blare van hierdie twee plantgroepe en die benutting daarvan deur kameelperde te vergelyk en te verklaar. Die proteïeninhoud van die *Acacia* spesies is oor die algemeen hoër as dié van die *Combretum* spesies en is dus 'n beter bron van voedsel vir hierdie diere.

Keywords: Food selection, giraffe, leaves, *Acacia*, *Combretum*, chemical composition, crude protein, succulence

Introduction

In many of the studies on food selection and food preferences of giraffe (*Giraffa camelopardalis*) the *Acacia* and *Combretum* trees seem to be the most important food plants (Dagg, 1959; Hall-Martin, 1974; Kok & Opperman, 1980). The aim of the present study was to compare the chemical composition of the leaves of the *Acacia* and *Combretum* trees and to ascertain whether the differences in chemical composition influence food selection. The methods and materials are the same as described by Sauer (1983).

Results and Discussions

When the mean values of all fractions of the *Acacia* and *Combretum* species are compared it is apparent that the *Acacia* species have a higher crude protein content, with the exception of *Combretum imberbe* (Table 1). The *Combretum* species in general have a higher crude fibre, NFE, ether extract and ash content and a lower moisture content than the *Acacia* species (Table 1).

Table 1 Comparison of mean values of four dry matter fractions, moisture and NFE (wet sample fractions) of all *Acacia* and *Combretum* species utilized by giraffe

Plant species	Chemical composition (%)					
	H ₂ O	Protein	Crude fibre	NFE	Fat	Ash
<i>Acacia</i> species						
<i>A. caffra</i>	57,1	16,4	19,2	25,5	4,9	0,6
<i>A. karroo</i>	60,5	17,3	15,9	25,2	2,9	0,4
<i>A. senegal</i>	61,0	28,6	16,2	19,8	3,8	0,4
<i>A. exuvialis</i>	62,0	15,3	16,2	24,7	2,4	0,4
<i>A. gerrardii</i>	54,8	15,0	21,1	26,6	3,7	0,6
<i>A. nigrescens</i>	63,1	13,0	20,0	22,3	4,2	0,5
<i>A. ataxacantha</i>	53,5	17,4	17,1	26,5	4,1	0,5
<i>A. erubescens</i>	59,2	19,4	18,5	23,6	4,1	0,5
<i>A. tortilis</i>	46,1	16,5	19,8	32,7	3,6	0,8
<i>A. nilotica</i>	52,0	12,9	13,7	32,2	5,1	1,1
<i>A. robusta</i>	55,6	14,3	24,8	26,1	2,9	0,4
<i>Combretum</i> species						
<i>C. apiculatum</i>	52,9	11,1	22,1	29,6	2,6	0,9
<i>C. hereroense</i>	56,8	10,7	21,7	27,1	3,3	1,1
<i>C. imberbe</i>	65,2	12,5	27,6	18,9	3,7	0,9
<i>C. erythrophyllum</i>	59,1	13,3	20,6	23,9	5,8	1,4
<i>C. zeyheri</i>	55,5	14,3	21,0	26,7	3,5	0,5
<i>C. molle</i>	51,3	10,8	23,0	28,9	5,4	1,0

When the utilization, protein content and succulence of the most preferred *Acacia* species are compared with the *Combretum* species, there are no significant differences between the species for any of these variables over a full year (Figure 1). However, both these plant groups are preferred species although the *Acacia* species are more sought after. Unfortunately no data are available on the chemical com-

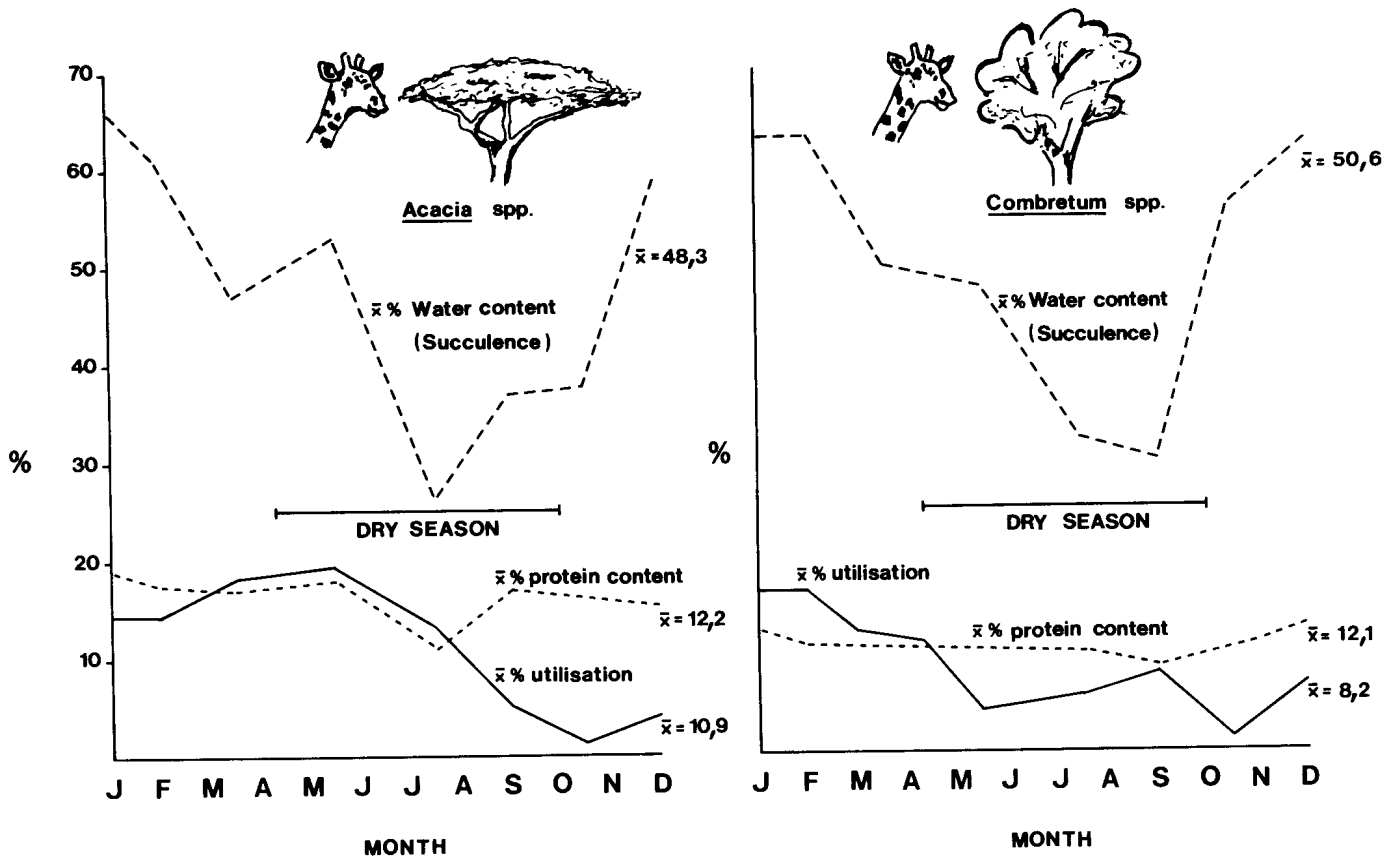


Figure 1 A comparative diagram of the average percentage utilization of the five preferred *Acacia* species (*senegal*; *caffra*, *erubescens*, *karroo* and *tortilis* in order of preference) browsed by giraffe in relation to the mean protein content and succulence of leaves compared with the five preferred *Combretum* species (*erythrophyllum*, *apiculatum*, *imberbe*, *zeyheri* and *molle*) on the same basis. Preferred food plant species were selected by taking availability (based on botanical surveys) and food selection data into account.

position of the plant species available, but not utilized by giraffes, to compare with these two groups of plants.

The utilization of both plant groups decreased drastically during the latter half of the dry season. This is because these trees are all deciduous and thus shed their leaves. The *Acacia* species lose their leaves gradually replacing the lost leaves simultaneously. Furthermore, they do not shed their leaves at the same time just as they do not flower and produce fruit simultaneously. This is important for the survival of browsing animals since it reduces feeding stress.

The decline in utilization from August to November (Figure 1) does not provide an indication of the availability, thus, the low percentage utilization is simply because very few leaves, flowers and fruit were available to feed on (Figure 1).

Utilization of the *Combretum* species increased gradually from May to September while the succulence of the leaves declined markedly. Concomitantly utilization of the *Acacia* species decreased (Figure 1). The leaf protein content of the *Combretum* species remained more or less constant during this period but the protein content decreased in the leaves of the *Acacia* species.

Conclusion

Taking availability into account, the utilization by giraffe of the preferred food plants mostly correlates positively with the protein content of the leaves throughout the year, while during the wet warm season the succulence of the leaves may be important (Sauer *et al.*, 1982; Figure 1) although there

is no significant correlation between utilization and succulence in specific *Acacia* species.

When the mean protein content of *Acacia* species is compared with that of the other 31 plant species studied, it is apparent that the protein content is higher in the *Acacia* species with the following exceptions; *Terminalia prunioides*, *Fagara capensis*, *Ziziphus mucronata* and *Dichrostachys cinerea* (Sauer, 1977). *D. cinerea* is also a member of the Leguminosae that could possibly make use of the *Rhizobium* bacteria in the root nodes to bind free nitrogen from the atmosphere and thus make it available for protein synthesis in the plant.

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