

Observations on the seasonal browsing and grazing behaviour of camels (*Camelus dromedarius*) in southern Darfur-Sudan

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Abstract

The observations about camels behaviour during browsing and grazing were recorded during dry and green season in southern Darfur (Latitude 8° 30' and 13° 30' North), by using apparently healthy free ranging camels during the months of March – May (dry season) and August – September (green season). Total number of 210 indigenous Arabian camels of different age was used in this study. Camels were observed to be selective browser rather than grazer during dry and green seasons; also they were able to consume whatever plants available to fulfil their needs during the dry season. Camels did not stay long on a single species of plants, but were observed to take several mouthfuls and to move to another or to the same species browsing young green stems or branches with or without thorns and together with leaves, young growing shoots, flowers and fruits during green season, however, it has been observed that camels concentrate on certain evergreen trees and bushes together with the dry grasses if found during the dry season in the dry wadi beds. Camels are selective feeders not only with regard to plants but also in respect of part of the plants they eat , on the natural range they browse and graze at any time of the day but they tend to avoid feeding during the hottest period of the day and adopt positions. Camels prefer to feed on bushes and trees due to their anatomical adaptations. These findings indicate that camels are able to adapt themselves to the seasonal pasture fluctuations without affecting the trees they browsed because of their selectivity to choose some parts not the entire plant.

Key words: Behaviour, Browsing, Camels, Grazing, Season

Introduction

Camels in Southern Darfur state are commonly raised under nomadic conditions. In southern Darfur, the natural pasture is classified into three main regions according to the natural use (Babiker et al., 1999). The first region is the northern region which is located between 11°-13° North in the semi arid. The rainfall in this region ranges between 200 and 300 mm. This region is considered to be a good pasture in the rainy season (autumn habitats/Makharif). The predominant grasses and herbs in this region are *Cenchrus biflorus*, *Dactyloctenium aegyptium* and others, while the predominant trees and bushes include *Combretum aculeatum*, *Grewia tenax*, *Cadaba forinosa*, *Acacia mellifera* and *Acacia senegal*. The second region is the middle region which is located in sandy soil between 10°-11° North in the low land savannah area. The rainfall in this region ranges between 300 and 600 mm. The predominant grasses in this region are *Echinochloa colonum*, *Cenchrus biflorus*, *Dactyloctenium aegyptium*

and others, while the predominant evergreen trees include *Acacia senegal*, *Acacia seyal*, *Acacia nilotica*, *Balanites aegyptiaca*, *Guiera senegalensis*, *Ziziphus spina-christi*, *Dichrostachys glomerata*, *Tamarindus indica* and *Albizia amara*, this region is also considered as autumn habitat (Makharif). The third region is the southern region, which is located in the wood savannah between 8°-10° north, and which is characterized by its clay soil. The rainfall in this region ranges between 600 and 1000 mm. This region is characterized by a pasture rich in grasses and trees such as *Acacia sieberana*, *Bauhinia rufescens*, *Celtis integrifolia*, *Acacia seyal* and *Balanitis aegyptiaca*. This region is considered as a traditional summer habitats (Masaif).

Camels migrate from the dry sandy plains in the north of Darfur to the richer savannah in the vicinity of Bahr El Arab in the southern region. Then the herds embark on the return journey after reaching their late summer destination (Babiker, 1984). It is well documented that camels produce milk, meat, wool, hair and hides ; and serves for riding (Schwartz and Dioli,

1992) and are efficient in producing draught power than any other domestic animal with the possible exception of the horse (Wilson, 1984). Therefore, the present study aimed to highlight on the behaviour of camels during browsing and grazing in the dry and green season in this area.

Materials and methods

The browsing and grazing behaviour of a total number of 210 naturally ranging indigenous camels were observed during both dry-and green season. The behaviour of camels in the natural pasture was monitored based on weekly field trips in Southern Darfur, where direct photographic documentation of the Camel behaviour has been implied. During the study period the observations take 4 hours\day weekly that spend in each visit.

Results and discussion

Camels were observed to be selective browser and grazer during green season, where plenty of forage was available (Fig. 1). On the other hand, camels were observed to consume whatever plants available to fulfil their needs during the dry season (Fig. 2). However, it has been observed that camels concentrate on certain evergreen trees and bushes during the dry season (Fig. 3). Camels usually browse evergreen plants in the dry season together with dry grasses. Furthermore, camels were observed to browse trees as well as bushes which contain leaves, young twigs, fruits and flowers in the dry wadi beds (Fig. 4).

In the green season, camels were observed to take several mouthfuls of grasses and herbs indiscriminately from the plant before moving to another (Fig. 5).



Fig. 1: Camels grazing on green grasses during the green season.

Camels did not stay long on a single species of plants, but were observed to take several mouthfuls and to move to another or to the same species browsing young



Fig. 2: Camels grazing on dry grasses during the dry season



Fig. 3: Green trees are important during the dry season when the herb layer disappears.



Fig. 4: Camels are very versatile feeders. They feed on coarse perennial grasses, shrubs and trees.

green stems or branches with or without thorns and together with leaves, young growing shoots, flowers and fruits, these observations also reported by Amin et. al. (2007). The bifid upper lip of camels makes it easy to select small leaves from among stems, dense branches



Fig. 5: Camel's bite after grazing (*Ipomea spp.*)



Fig. 6: Camels browse leaves between thorns as well as ingesting thorns



Fig. 7: The prehensile lips allow camels to pick even small leaves (*Acacia seyal*)

or tall thorns (Fig. 6). The anatomical adaptations such as the mobile and prehensile split upper lip, the long tongue, make the camel a suitable browser rather than grazer (Fig. 3, 4, 6, 7 and 8). Moreover, camels as browsers are characterized by stretched necks, extended



Fig. 8: The bifid upper lip allows camels to pick even small leaves (*Acacia nilotica*)



Fig. 9: Camels can browse to heights as long as 2m above ground



Fig. 10: Camels select with great accuracy plant parts of higher digestibility



Fig. 11: Camels browse a very wide range of species of trees



Fig. 12: Adaptation position to decrease water and energy losses in the dromedary camel

heads and tongues to grasp thorny twigs (Fig. 9). Camels are selective feeders not only with regard to plants, but also in respect of the part of the plants they eat (Fig. 10, 11). Camels on natural range browse and graze at any time of the day. Nevertheless, during very hot weather, they tend to avoid feeding during the hottest period of the day and adopt positions (Fig. 12) which reduce heat gain and conserve energy (Wilson, 1984, Wardeh, 1997). The observations revealed that camels are suitable selective browser rather than grazer

(Fig. 3, 4, 6, 7, 8, 9, 10 and 11). Camels prefer to feed on bushes and trees due to their anatomical adaptations. The mobile and prehensile split upper lip, the long tongue, the stretched neck and the extended heads to grasp thorny twigs constitute anatomical adaptations that enable camels to browse more than to graze. The results obtained in this study indicate that camels are selective feeders not only with regard to plants but also in respect to the consumed parts of plants (Fig. 10, 11). This selectivity could be due to the adaptation mechanism to the seasonal fluctuations in forage.

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