Feeding Tannins to Captive Black Rhinoceros (*Diceros bicornis*): Results of a Pilot Study

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It has been postulated that the lack of tannins in captive diets for black rhinoceros (Diceros bicornis) might be responsible for the occurence of iron overload in captive specimens. In theory, the presence of iron-chelating tannins in natural diets might have induced the evolution of an especially effective iron absorption mechanism in the species, which would lead to excessive iron uptake in the absence of such chelators. In order to investigate this problem, 5 captive rhinos were fed two diets, one with and one without a tannic acid supplement. Feed intake and faecal output were measured for two 5-day periods, respectively. Additionally, the use of several markers (Co-EDTA, Cr-mordanted fibre, n-alkane C36) as pusle-dose and steady state markers was assessed. The animals accepted the tannic acid-supplemented food without hesistation. Measured passage rates suggest that a 4-day collection period should result in total recovery of a pulse-dose marker. Iron concentration of faeces did not differ significantly between treatments and was apparently influenced by soil intake from the enclosure. We conclude that it is feasible to produce tannin-containing feeds for the further evaluation of iron metabolism in black rhinos. Either animals should be kept indoors during trials to prevent soil intake, or an iron isotope should be applied as a pulse-dose marker to compare recoveries between treatments. Additionally, we will present data on digestibilities and marker recoveries.

Feeding Habits of Desert Dwelling Black Rhinoceros (*Diceros bicornis*), in Kunene Region Northwest of Namibia

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The feeding habits of black rhinoceros were studied by using the feeding track method and recording bites taken. (after Hall-Martin et al, 1982)

Study period: June 2000 to October 2000 (dry season). 35 feeding tracks, 10149 bites on 1950 plants and 51977 available plants in vegetation plots were recorded.

Out of 171 available plant species black rhinoceros fed on 73 food plant species. Centre of the study was the basic data collection and the examination of the selectivity of black rhinoceros referring to the height of bites, browsed and available plants, to the greenness of browsed and available plants and to the diversity of plant community and the influence to the feeding habits.

The data were recorded in about 1500 km². The climate is semi-arid. Mean annual rainfall <150 mm/yr.

Food preferences / Food selectivity

The index of usage was calculated. The number of bites divided by available plants come to the index of usage.

The mean value of the index shows a high utilization over 15 by *Acacia reficiens* (33), *Sesbania pachycarpa* (19,08), *Euphorbia damarana* (17,27) and *Gymnosporia senegalensis* (16,83). Further species with high mean value are *Calicorema capitata* (14,56), *Gossypium triphyllum* (9,32), *Terminalia pruinoides* (7,39) and *Acacia erubescens* (5,57).

Plant types

The plant species were classified into four groups (woody, dwarf shrubs, succulents and herbs). Woody plants include trees and shrubs with woody stems such as *Colophospermum mopane* or *Catophractes alexandri*. Dwarf-shrubs are small and much branched shrublets like *Indigofera adenocarpa* or *Tephrosia oxygona*. Succulent plants are all *Euphorbiacea* and plants like *Zygophyllum simplex*.

The food species are distributed as follows (n = 46): woody 19,57%, herb 50%, dwarf shrub 23,91%, succulents 6,52%. The same distribution for all browsed plants (n = 1815): woody 22,92%, herb 31,01%, dwarf shrub 14,16%, succulents 31,90%. Only woody plants and succulents were used more as offered.

Greenness

The greenness was established for browsed plants in each feeding track and for available plants in each vegetation circle

Greenness of plants during the study period shows a decrease of available plants in time progress. Whereas the browsed plants are on a high green level all the time. There is no significant difference in greenness of start & end vegetation circle. The average of the difference of all feeding tracks amounts to 3,94%.

A selectivity referring to the greenness was found in the relation of browsed plants and available plants.

Diversity

The diversity of the bites and of the available plants on the 35 feeding tracks were calculated by Hill's N2 values (N2 = 1/CP˜ + P2 + . . . Pn˜) (Hill 1973). An indication of the diversity of available forage and the diversity of

Diversity of available forage, described by Hill's N2 Index is higher than browsed plant diversity by rhino (Mann-Whitney U-test). The good rain season 1999 – 2000 could be a reason for a higher diversity of available plants than in a normal rain season.

Height

The diagram of height of bites, browsed plants and available plants shows a close relation between height of bites and height of browsed plants, whereas the relation to the height of available plants in the categories under 10 cm and over 50 cm depart of the height of bites and browsed plants. A significant selection were established for plant height over 50 cm.

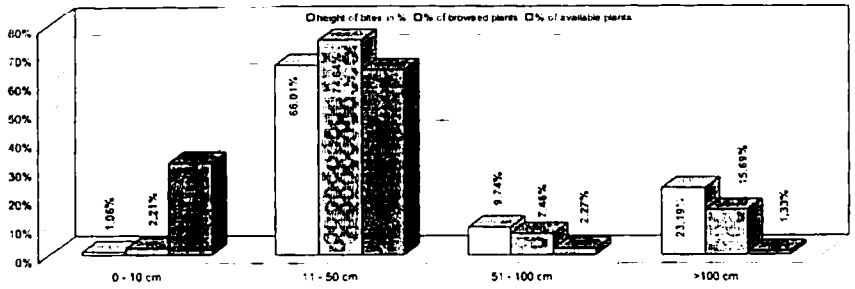

Fig. 1: Diagram of the height of all bites, all browsed plants and all available plants in the four different categories.

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Tab. 1: Food species of desert dwelling Black Rhinoceros. The food species are arrange in alphabetical order of family. These 25 species contain over 90% of all bites.

Acanthaceae
Blepharis pruinosa Engl.
Monechma cleomides (S. Moore) C.B.Clarke
Monechma leucoderma (Schinz) C.B.Clarke
Amaranthaceae
Calicorema capitata (Moq.) Hook f.
Asteraceae
Tripteris sp. / Osteospermum sp.
Bigoniaceae
Catophractes alexandri D. Don
Celastraceae
Gymnosporia senegalensis (Lam.) Loes.
Combretaceae
Terminalia pruinoides M. A. Lawson
Convolvulvaceae
Seddera schinzantha Hallier f.
Cucurbaticeae
Cucumis africanus L.f.
Euphorbiaceae
Euphorbia damarana
Euphorbia glanduligera Pax.
Fabaceae
Acacia erubescens Welw. ex. Oliv.
Colophospermum mopane
Cullen obtusifolia (DC.) C.H. Strit
Indigofera adenocarpa E. Mey.
Otoptera burchellii DC.
Sesbania pachycarpa DC.
Tephrosia oxygona Welw. ex. Baker subsp. *lactea* (Schinz) A. Schreib
Geraniaceae
Monsonia umbellata Harv.
Hydrophyllaceae
Codon schenckii Schinz
Malvaceae
Gossypium triphyllum (Harv.) Hochr.
Periplocaceae
Curroria decidua Planch. ex. Hook. f. & Benth.
Rutaceae
Thamnosma africana Engl.
Zygophyllaceae
Tribulus zeyheri Sond. subsp. *zeyheri*

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