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DIET OF CHILTAN WILD GOAT *CAPRA AEGAGRUS CHILTANENSIS* IN HAZARGANJI CHILTAN NATIONAL PARK

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ABSTRACT

Pakistan is one of those unique countries that have rich diversity of flora and fauna living in a variety of ecosystem types, landscapes. Pakistan has nineteen national parks, the Harzarganji Chiltan National Park one of them. This park has given ample protection to Chiltan wild goat (*Capra aegagrus chiltanensis)*, the Chiltan wild goat is endemic to Pakistan. According to this study they fed mainly on leaves of *Fiscus palmate* (11.6%) *Pisticia kanjala* (9.1%), *Juniper polycarpes* (8.3%), *Cynodon dactylon* (5.5%), *Hordium murinum* (3.0%) and seeds of *Moris alba* (3.1%) *Rosa lacrans* (3.0%) along with *Chenopodium sp*. (2.0%). Out of 16 plants species *Fiscus palmata* were consumed intensively. About 20 % of the wild goat diet was due to other plants which could not be identified. This is the preliminary study on diet and required long term studies for better understanding of the food habits of wild goat.

Keywords: *Capra aegagrus chiltanensis*, diet, hazarganji chiltan park, balochistan.

INTRODUCTION

Pakistan is one of those rare countries that have rich diversity of fauna and flora living in a variety of ecosystem types and landscapes. The province of Balochistan is the only area in the world where the fauna of three global zoogeographical regions is found. The animals of Palearctic or Eurasian region are found in the whole province except in Sibi plains triangle, where Oriental or Indian and southeast Asian species are found. Animals of African affinity or the Ethiopian zoogeographical region are distributed along the Mekran coast and beyond into the southeastern ranges of the province (Mirza, 2005). Balochistan is the largest province of Pakistan with diverse species and habitats. At the same time, most of the biodiversity of the area has not been evaluated comprehensively. Wide variations in physical features and climate have produced diverse landscapes, ecosystems and habitats that are important to the national and global heritage. For example, Balochistan has one of the largest blocks of juniper (*Juniperus excelsa*) forests in the world, covering approximately 141,000 hectares (Sheikh, 2006).The Hazarganji Chiltan National Park, located about 20 km southwest of Quetta in the province of Balochistan, is one of 19 national parks in Pakistan (Khan and Siddiqui, 2005). The park was established in 1980 and covers an area of over 32,500 acre at an altitude ranging from 2021 to 3264 meters.

In Pakistan, the Chiltan wild goat (*Capra aegagrus chiltanensis)* is found in Hazarganji National Park. This wild goat (Fig. 1) occurs only in a restricted area between the extensive range of *Capra aegagrus* to the south and *Capra falconeri* to the North (Robert, 2005). According to Schaller (1980) it is a wild goat (*Capra aegagrus*) not a Markhor, "Gad" (wild sheep). However based on horn core morphology and coat colour of mature males, it seem that it might be a hybrid between straight horned Markhor and *Persian pasang* (this is a goat). This view is now widely accepted (Robert, 1997). Population dynamics of wild goat has been studied by many workers including Schaller and Mirza, (1971). Schaller and Laurie (1974), Schaller and Khan (1975), Schaller (1977), Mirza (1975), Roberts (1997 and 2005), Khan and Siddiqui (2005), Shafique *et al*. (1997 and 2002), Shafique and Barkati (2002).

The present paper described the feeding niche of Chiltan wild goat on uncultivated forest land of Hazarganji Quetta, Balochistan. The Chiltan wild goat is endemic to Pakistan and is listed as Critically Endangered (CR) in the IUCN Red List. This wild goat is gregarious and diurnal in feeding and has similar habits to the Straight-horned Markhor. They will browse the leaves and bushes as well as small shrubs and forbes. The stomach contents of the Chiltan wild goat were analyzed to provide information that might be useful for the management of wild goat population and its abundance.

MATERIALS AND METHODS

A total of 5 stomach of wild goat provided by the Forest Department Quetta was studied in 2002. The stomach were injected with and preserved in 10 % formalin. In the laboratory the stomach content were washed over three consecutive sieves (Mesh size 1mm, 2.5mm and 4mm). Fifteen samples were randomly taken from the 2.5mm and 4 mm sieves each and 100 fragments identified under 10x magnification. The content of the 1mm sieve were examined under 100x magnification by making 20 slides according to the procedure in Hansen *et al.* (1971). On each slide five locations were chosen randomly and fragments identified. A sample of at least 300 fragments of the contents of each stomach was thus examined. A

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reference collection of 50 plants species facilitated identifications. The slides of reference plants material were prepared as described by Hansen *et al.* (1971). The reference plants including seeds in the prevalent phonological states were also collected, identified and preserved. Vegetative and reproductive parts of the plants recovered from the stomach were identified through morphological and anatomical comparison with standard reference plant material.

The frequency of each food items in each sieve was expressed as percentage (x) of the total number of fragments in the sample of that sieve. The contents of each sieve were dried and weighed and the percentage (y)

Fig. 1. Chiltan wild goat. (Photo Credit Zeeshan Mirza, WWF-Pakistan)

Table 1. Percent relative frequency and percent relative occurrence of various food items in five stomach of Chiltan wild goat Figures in parenthesis indicate the number of fragments and occurrence observed.

S. No.	Food items	Part eaten	% relative frequency	% occurrence
1	*Cynodon dactylon*	Leaves	5.5 (54)	22.2 (40)
2	*Hordium murinum*	Leaves	3.0 (30)	13.9 (25)
3	*Pistacia kanjala*	Leaves	9.1 (90)	41.2 (75)
4	*Fiscus palmata*	Leaves	11.6 (115)	44.4 (80)
5	*Solsola sp.*	Leaves	1.4 (14)	4.4 (8)
6	*Moris alba*	Seed	3.1 (33)	15.0
		Leaves	1.8 (18)	5.0 (9)
7	*Pennisetum orientale*	Leaves	4.0 (40)	11.6 (21)
		Stem	5.4 (53)	16.0 (29)
8	*Juniper polycarpes*	Leaves	8.3 (82)	35.6 (69)
		Bark	9.0 (89)	40.0 (72)
9	*Chenopodium sp.*	Seed	2.0 (20)	7.2 (13)
10	*Amarantus sp.*	Leaves	1.5 (15)	3.3 (6)
11	*Heliotropium decicarpa*	Leaves	1.8 (18)	4.4 (8)
12	*Rosa laccrans*	Leaves	0.7 (7)	2.2 (9)
		Seed	3.0 (35)	14.4 (26)
13	*Trifolium sp.*	Leaves	2.0 (20)	6.1 (11)
14	*Colvulus arrensus*	Seed	2.8 (28)	10.0 (18)
		Leaves	1.4 (14)	2.8 (5)
15	*Daphne mucronata*	Leaves	1.8 (18)	5.0 (9)
16	*Symbopogan jaunarauchosa*	Leaves	2.7 (28)	7.2 (13)
17	Unknown plants fragments	Flowers	4.5 (47)	18.9 (34)
18	Unknown plants fragments	Stems + leaves	56+112 (168) 16.2	36+126(162) 90.0
	Total identifiable plants fragments		79.2 (821)	
	Total unidentifiable plants fragments		20.7 (215)	
	Total fragments examined		1036	180

Table 2. Berger-Parker index of diversity for the five samples of stomach contents of Chiltan wild goat.

		Number of fragments of food particles				
S. No	Plants species	Leaves	Stem	Flower	Seed	Roots
1	*Pistacia kanjala*	90	0	0	0	0
2	*Fiscus palmata*	115	0	0	0	0
3	*Juniper polycarpes*	82	89	0	0	0
4	*Cynodon dactylon*	54	0	0	0	0
5	*Pennisetum orientle*	40	53	0	0	0
6	*Moris alba*	14	0	0	33	0
7	*Symbopogam jaunaranchosa*	28	0	0	0	0
8	*Chenopodium sp.*	0	0	0	20	0
9	*Rosa lacrans*	7	0	0	35	0
10	*Hordium morinum*	30	0	0	0	0
11	*Colvulus arvensus*	14	0	0	28	0
12	*Trifolum sp.*	20	0	0	0	0
13	*Daphne sp.*	18	0	0	0	0
14	*Heliotropium decicarpa*	18	0	0	0	0
15	*Solsola sp.*	19	0	0	0	0
16	*Amaranths sp.*	15	0	0	0	0
17	Unknown plants	56	112	47	0	0
	Total number of food particles (N)	615	254	47	116	0
	Maximum abundant food (n)	115	112	47	35	0
	Berger-parker index d = (n maximum /N)	0.19	0.44	1.0	0.30	0
	1/d	5.3	2.3	1.0	3.3	0

of the total dry weight of the stomach contents retained by each sieves was calculated. The quantity of each food item then is expressed as a percentage of the total stomach content.

Percentage of the food item

$$\sum_{1} = \frac{x_i y_i}{100} \; (i = 1,2,3 \text{ for each sieve})$$

To determine degree of dominance of the individual food items in the samples, Berger- Parker index was used (Magurran, 1988).

RESULTS AND DISCUSSION

An analysis of stomach contents of five specimens of Chiltan wild goat revealed that only 16 species of plants were represented in the contents (Table 1). Among the flora of the Park 225 species of plants has been reported (Ali, 1978). Table 1 showed that *Fiscus palmata* (11.6%), *Pistacia kanjala* (9.1%) and *Juniper polycarpes* (8.3%) were consumed more while. *Cynodon dactylon* (5.5%), *Hordium murinum* (3.0%) consumed much less intensively. *Cynodon dactylon* and *Hordium murinum* are grasses and also the main diet of the other small mammals. Berger-Parker index of diversity (Table 2) for the 5 samples of the stomach contents showed that wild goat has a narrow feeding niche in the non crop habitats of the present study area where it exploits about a dozen species of plants for its food and supplements the same with small quantities of grass. Table 2 also showed that the wild goat depends mainly on leaves and seeds of the plants. Higher diversity index value for the leaves was observed 5.3 and for seeds 3.3 respectively. Preference has also been given to stem of the plants that is 2.3 while flowers were less consumed (Table 2).

Our results confirm the opinion of the (Roberts, 1997) that wild goat mostly depends on dry or fresh leaves. Roots of the plants were not part of the food. In this study about 20% of the diet was due to other plants which could not be identified.

In Pakistan seasonal changes in temperature and rainfall occur and these will undoubtedly influence abundance and diet of Chiltan wild goat population. Our data is too small and results should be considered typical for one season, the winter. Long-term studies are needed to better understand the ecology of this important animal in Pakistan.

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