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Assessing Changes In Dietary Requirements And Food Preferences Blackbuck On A Seasonal Basis.

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Abstract

This study investigated the seasonal variations in dietary requirements and food preferences of the blackbuck (*Antilope cervicapra*), a species whose feeding behavior and nutritional needs shifted with environmental changes. Through systematic observation and data collection over different seasons, the research aimed to delineate the seasonal patterns in the blackbuck's diet, highlighting variations in food intake, nutritional needs, and preference shifts. Utilizing a combination of field surveys, dietary analysis, and behavioral observations, we examined how changes in forage availability and quality impacted the dietary choices and nutritional status of blackbucks. The findings revealed significant seasonal adjustments in diet composition, with notable shifts in preferred food sources corresponding to seasonal fluctuations in resource availability. These results underscored the adaptive strategies of blackbucks in response to environmental variations and provided insights into the species' ecological adaptability. The study contributed valuable knowledge for the management and conservation of blackbuck populations, particularly in the context of habitat management and the design of conservation strategies that accounted for seasonal dietary needs.

Keywords: Blackbuck, Food, Grassland, Seasonal Variation, Grazing.

INTRODUCTION

The blackbuck (*Antilope cervicapra*) is a medium-sized antelope species widely distributed across India, inhabiting semi-desert plains and open forests. Blackbucks are characterized by their elegant and slender appearance. They stand 32-35 inches (81 cm) tall at the shoulder and weigh between 40-50 kg. Adult males are slightly larger, standing 73-83 cm tall at the shoulder, with an average head and body length of 120 cm and a tail measuring 10-17 cm. The males possess distinct corkscrew-shaped horns, which are densely ringed at the base and spiral up to four turns, ranging in length from 50 to 61 cm, with some reaching up to 79 cm from base to tip. These horns exhibit a V-shaped pattern. Females, on the other hand, are typically hornless and exhibit a fawn coloration on their dorsal side and white underneath (Gyawli *et al.*, 2020).

Blackbucks thrive in grasslands and sparsely forested areas where perennial water sources are available to meet their daily needs. The availability of forage in their habitat is influenced by various physiological factors, seasonal changes, and terrain topography. Blackbucks preferentially consume short grasses and tend to avoid tall grasslands and woody areas, reflecting their dietary reliance on grasses (Isvaran, 2007). During the monsoon season, agricultural lands and water resource areas are covered with high-quality grasses, and blackbucks favor fresh leaves, grasses, grains, cereals, vegetables, and shrub and tree leaves (Jhala, 2007). Grasses are rich in carbohydrates and proteins, which, when ingested, are converted by the ruminant digestive system into short-chain fatty acids, providing high-energy food. However, in winter, the nutritional

value of grass declines rapidly. During this period, when grasses are scarce, blackbucks are compelled to feed on less digestible, hard shrubs with lower protein content (Wegge *et al.*, 2006).

MATERIAL AND METHODS

Blackbucks are well-adapted to short grassland systems but are limited in their distribution by the availability of persistent surface water. For the present investigation, study sites were selected across different regions of the Sorsan grassland, which varied in habitat types and vegetation composition. To determine forage preference, a meticulous direct examination of feeding sites was conducted (Altman, 1974).

Food habits were assessed by observing blackbucks feeding within a 25-meter radius of the observer in selected habitats. Groups of 10-20 blackbucks were monitored continuously for periods ranging from 24 to 36 hours in each season. Scan sampling was employed to determine the proportion of blackbucks grazing in various habitats (Altman, 1974). During the study period, field binoculars with a magnification of 15-30x were used to accurately record grazing activities.

RESULTS AND DISCUSSION

The study on blackbucks focused on examining seasonal variations in their nutritional needs and food preferences. Factors such as physiographic features, seasonal fluctuations, and terrain topography all influence food availability in the studied area. The primary food sources for blackbucks include fresh green leaves, various grasses, and crops, although they occasionally consume the leaves of shrubs and trees.

Throughout the study, blackbucks were observed feeding on a diverse range of plants. Regular observations were conducted in accessible areas, revealing a preference for grasses and crops in specific locations. Monthly data collection was utilized to assess the degree of preference for different plant species, as well as the variability in crop patterns throughout the year. Additionally, food plant preferences and non-preferences were evaluated at various phenological stages of the plants.

The summer season is not entirely dry, and no food crisis was observed during the initial part of the season. During this period, species such as *Tephrosia purpurea*, *Cenchrus biflorus*, *Cenchrus setigerus*, and *Salvadora oleoides* provide soft, tender leaves that are consumed by blackbucks. As summer progresses, grasses like *Cynodondactylon* and *Cyperus rotundus* become particularly popular.

However, from mid-April to mid-June, the area experiences a severe scarcity of fodder during the latter part of summer. Blackbucks encounter significant difficulties in obtaining the necessary nourishment. In their search for food and water, they frequently move from one location to another. They prefer to stay near streams and ponds, where tender grasses are more abundant. During periods of forage scarcity, blackbucks also venture into village peripheries in search of food items such as *Prosopis cineraria*, *Salvadora oleoides*, *Prosopis juliflora*, *Ziziphus nummularia*, and *Acacia arabica*, as well as other vegetable crops. Additionally, they travel to adjacent hillsides to feed and rest.

Cynodon species and Cyperus rotundus are the preferred grasses among the available options. Consequently, the study indicates that blackbucks consume Cynodon species, Cyperus rotundus, and Tephrosia purpurea throughout the year, while other vegetation is consumed only during specific seasons.

During the peak summer season, when there is a shortage of fodder and forage digestibility is low, blackbucks appear to rely on body reserves. They consume fewer calories and reduce their movement, likely to conserve energy and mitigate the high physiological costs associated with digesting less digestible food. When water is scarce, blackbucks exhibit similar physiological and behavioral responses, including concentrating urine and feces, panting, and feeding at specific times of day to maximize water absorption from their diet.

During the winter months, the cropping patterns in the study region undergo significant changes. The most prominent crops include legumes and vegetables, such as tomato, brinjal, potato, beans, ladyfinger, and spinach. As the region dries up, blackbucks are able to move around in both small and large herds in search of food. During the winter harvesting stage, pulses constitute approximately 30% of the total crop production, including cereals.

A diverse range of grasses and pulses, such as *Cicer arietinum* (chickpeas), *Triticum aestivum* (wheat), and *Brassica campestris* (mustard), have been observed in the blackbuck's diet. Among these, *Cicer arietinum* (chickpeas) is preferentially consumed. Blackbucks regularly feed on chickpea plants throughout the dry cropping season and also rest in the fields. If startled or threatened, blackbucks seek refuge in nearby cornfields. Additionally, blackbuck incursions into rabi-crop regions at night support this observation. Soft wheat leaves are also consumed by blackbucks as they traverse these fields.

Grasses such as *Cynodondactylon*, *Cyperus rotundus*, and *Celosia argentea* are favored food sources for blackbucks during this time. *Celosia argentea* is particularly consumed by blackbucks, as it is available only during this season. They exhibit a preference for the soft leaves of rice plants in paddy fields, avoiding the coarser parts of the plant. Blackbucks also consume the entire plant of *Brassica campestris* (mustard), with a notable preference for the tender pods, which are more favored than other food items. There have been no significant losses to immature crop plants, as the crop fields are dense and resemble thickets, deterring blackbucks from approaching these agricultural areas, such as those growing *Zea mays* (corn).

During the rainy season, the environment becomes verdant as new grasses, shrubs, and tree species emerge. On the higher grounds, minor cereal crops such as mung beans and bajra are sown, while paddy planting begins. Vegetables are also cultivated in local farmlands. Blackbucks are particularly attracted to tender paddy shoots, though they show a stronger preference for lush, green, and vibrant crops.

During the peak monsoon season (August-September), when rice fields are inundated to varying depths, blackbucks avoid the muddy central portions of the paddy fields. Instead, they prefer to graze on grasses located along the bunds and in adjacent grazing areas, often moving away from or grazing beside these areas. To deter blackbucks from the paddy sapling grounds and vegetable fields, farmers employ scarecrows of various shapes, sizes, and colors, strategically positioned to frighten and scatter the animals. Additionally, farmers use beat drums and wind-operated tin drums to further repel blackbucks from vegetable crop areas.

Blackbucks generally avoid the leaves and fruits of many plant species. Their feeding preferences appear to be influenced not only by the softness and sweetness of the food plants but also by their fragrance.

During the rainy season, blackbucks maintain a feeding schedule similar to that of the summer months, with the exception of periods of heavy and intense rainfall. They generally avoid feeding during heavy downpours. Throughout the monsoon, a diverse array of grasses and shrubs, as well as Kharif crops, become prominent in agricultural areas. Under these conditions, blackbucks often congregate in large numbers around highly valued crops. Among the most commonly consumed crops by blackbucks are *Vigna radiata* (mung beans) and *Cyamopsis tetragonoloba* (gawar).

Table 1: Seasonal Food Preference of Blackbuck.

Plants	Name of the plants	Winter	Summer	Monsoon	Parts of the plant taken
Grasses	*Cynodondactylon* (Dub)	++	+	+++	Entire plant
	Desmostachya bipinnate (Dab)	++	+	+++	Entire plant
	Elesinecompressa (Ghora dhub)	++	-	+	Entire plant
	Cenchrus biflors (bhurat)	-	+	++	Entire plant
	Cenchrus setigerous (Dhaman)	-	+	+	Entire plant
	Crotolariaburhia (Sinia)	++	+	+++	Entire plant
	Cyperus rotundus (Motho)	++	+	+++	Entire plant
Crops					
	Vigna radtia (Mung)	-	-	++	Leaves and pods
	Sorghum Vulgare (jawar)	-	-	+	Leaves
	Cyamposistetragonoloba (Gawar)	+++	-	++	Leaves, flowers and pods
Pulses	*Cicer arietinum(Chana)*	+	_	_	Leaves
	Vigna radtia (Mung)	-	-	++	Leaves and pods
	Pisum sativum (Matar)	+	_	_	Leaves
Oilseed	*Arachis hypogea (Mungfali)*	+	-	++	Leaves
Others	*Acacia nilotica (Desi Babool)*	+	+	++	Leaves
	Prosopis julifera (VilaytiBabool)	+	+++	_	Leaves,flowers and fruits
	Zizyphusnummularia (ber)	+	+	++	Leaves and fruits
	salavadoraolcoides (kharijaal)	+	+	++	Leaves

Note:- The + and –symbols indicates the degrees of preferences and non-preferences of the forage. During periods of limited forage availability, blackbucks also consume some less preferred plant species.

Table 2: Seasonal Cropping pattern in different months of a year.

Months	**CROPS**						
	Cicer arietinum (Chana)	*Vigna Radita* (Mung)	*Pennisetum glaucum* (Bajra)	*Sorghum Vulgare* (Jawar)	*Triticum aestivum* (Gehu)	*Cyamposistetragon oloba* (Gawar)	*Brassica compestris* (Sarso)
JAN.	GF	-	-	-	GF	-	GF
FEB.	GH	-	-	-	GH	-	GH
March	H	-	-	-	H	-	H
APRIL	-	-	-	-	-	-	-
MAY	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	-
JULY	-	S	S	S	-	S	-
AUG.	-	SG	SG	G	-	SG	-
SEPT.	-	GF	GF	G	-	GF	-
OCT.	S	GH	GH	GH	S	GH	S
NOV.	G	-	-	H	G	-	G
DEC.	SG	-	-	-	SG	-	SG

Abbreviations used in the table
G- growing; S- Sowing; H- Harvest; GF- Growing &Flowering;
GH- Growing&Harvesting; SG - Sowing &Growing

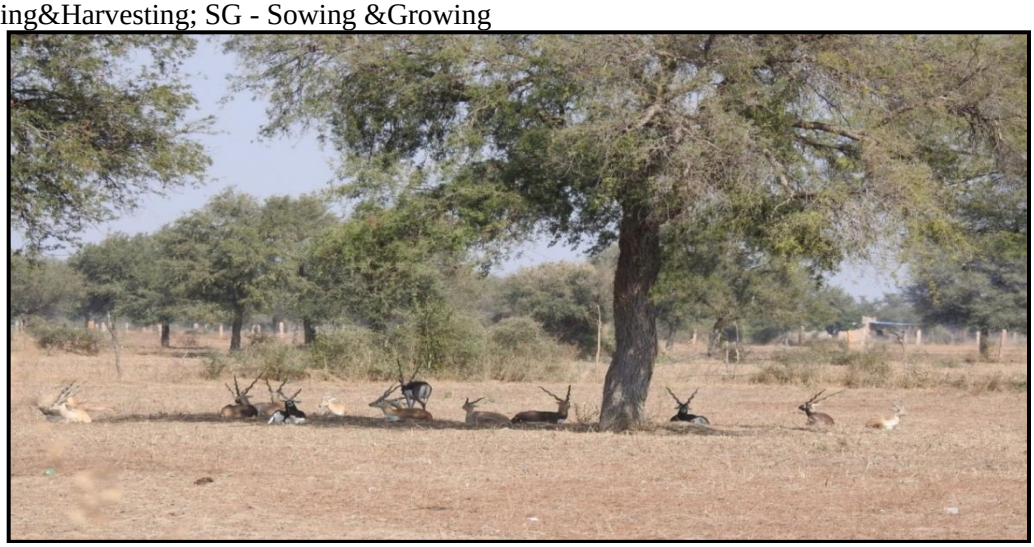

Figure: - 1. Resting pattern in summer season

(A)

(B)

Figure:-2. (A) Feeding during the rainy season. (B) Feeding during the winter season

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