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NILGAI, *BOSELAPHUS TRAGOCAMELUS* - A MAMMALIAN CROP PEST ARQUND JODHPUR

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Nilgai, *Boselaphus tragocamelus* is the largest common antelope found in open scrub forest in and around wild life sanctuaries, where little vegetation exists. Crop - damage by nilgai has been widely reported from all corners of India. A large number of nilgai occurs in and around agricultural areas and villages around Jodhpur *viz.* Beri-ganga, Daijar, Mandal - Nath, Kundli - Mata Mandir, Barli - Mandawata, Bamnia, Soorpura, Punjla, Jaji - Kalla and Banar. The followings reasons may be given for increasing nilgai in this region (a) lack of natural predators (b) deforestation for extensive agricultural activity (c) Overgrazing in the range land by domestic cattles and (d) the protection of these animals from Hindu communities who consider as near relative of cow. Tree cover consists mainly of *Acacia senegal, A. nilotica, Prosopis juliflora, P. cineraria, Euphorbia caducifolia and Caparis decidua.* These plants are generally used by nilgai as a day time shelter, make hiding cover but they do not provide sufficient food for as per their requirement, therefore it goes for crop-raiding in the late evening and at night, jumping across 6 - 7 feet high stone wall, barbed fencing and fences of dead or live thorny plant material and any other of fencing /barrier made to protect the crop-fields from wild and domestic animals. Due to habit of both grazing as well as browsing they devore every kind of farm species (both *rabi* and *kharif* crops). It has been observed that eating less but destroying more by trampling and causing damage are therefore regarded as serious mammalian crop pest and farmers wants to get rid of this unconventional pest. The farmers chase them away by just following them by making loud sound by crackers or air gun fires, following through tractors, empty tin or dried pumpkin filled with small stones and connected with strings. During this study (conducted from April to September, 1997) the feeding, food preferences and the measures used by local farmers to check this crop raider have been studied. Technically, corrals (enclosures), trenching or power fencing are suggested to mitigate the crop damage. Secondly animals could be translocated to wildlife sanctuaries from the sites they seen overcrowded or severe crop raiding problems.

INTRODUCTION

Nilgai, *Boselaphus tragocamelus* is one of the largest and a common antelope belongs to family Bovidae, order Artiodactyla of Mammalia, found in open scrub where little vegetation exists and in and around wildlife sanctuaries of India but avoid dense forests (Roonwall, 1987). The adult bull has a Iron gray coat with a white ring below each fetlock and two white spots on each cheek. Males possess horn which are small and smooth and triangular at the base and about 20-22 cm long; circular towards the tips. Males are about 1.95 m to 2.10 m long and stands at shoulder 1.30 m to 1.55 m. (Ellerman & Morrison - Scott, 1952).

The Nilgai is exclusively indigenous and distributed from foot hills of the Himalayas in the north to Mysore in the south, and Rajasthan to Bihar. It is not found in Eastern Bengal or Assam, or anywhere east of this nor in the Malabar coast of Madras or Ceylon. (Frank, 1929; Sanderson, 1955; Prater, 1980; Dunbar, 1982).

Around Jodhpur, which is a open scrub, they are associated with low hillocks, where we have observed these animals, living in two types of herds or as solitary bulls. A bisexual herd has 4 to 20 individuals of both sexes and of all age classes and the all-bull herds may comprise 2 to 8 adult and sub-adult males. Generally there is a single adult bull in a bisexual herd who leads the group but sometimes two or more bulls are also observed in one bisexual herd. Adult and leader - bull of bisexual herd have been observed fighting with a solitary bull or all-bull herd males for territories and other resources. The nilgai have been observed shifting from one area to other, depending upon the availability of crops. (Prakash, 1986; Rajpurohit, 1988).

Study Area

This paper is about a preliminary survey based on the observations and questionnaires from farmers of different villages around Jodhpur. The villages are Beri-ganga, Daijar, Mandal Nath, Kundli-Mata Mandir, Barli-Mandawata, Bamnia, Soorpura, Punjla, Jaji-kalan and Banar (Table I). The entire population of Nilgai could not be counted but on the basis of our observation and sighting of the animal there were 2 - 3 animals per sq. km. around Jodhpur. (Rajpurohit & Mohnot, 1988). The population density is not much but since last 5 - 10 years the people have destroyed the forest and range land by extending the agricultural fields. So there is no place for these antelopes except roaming around the crop-fields and people say nilgai population has increased, though becuase of lacking a predator of nilgai their number might have enhanced.

Animals were followed for regular observation and protocols were recorded for scan, *ad libitum* sampling (Altman, 1974).

Table I : *B. tragocamelus* and animals observed in study area under the survey in April, 1977.

Date of obser-vtions	Place	Type of groups	No. of individuals			
			Adult		Calves (Both sexes)	Total
			Males	Females		
21.4.97	Beri Ganga	Bisexual	1	9	4	14
21.4.97	Beri Ganga	Bisexual	2	6	3	11
21.4.97	Beri Ganga	All-bull herd	4	-	-	4
22.4.97	Bamnia	Bisexual	1	9	-	10
22.4.97	Barli-Mandawta	Bisexual	1	5	1	7
22.4.97	Jaji-Kalan	Bisexual	3	7	-	10
23.4.97	Soorpura	All-bull herd	5	-	-	5
23.4.97	Mandal Nath	All-bull herd	7	-	-	7
24.4.97	Kundli-Mata Oran	Bisexual	2	8	2	12
24.4.97	Kundli-Mata Oran	All-bull herd	6	-	-	6
24.4.97	Kundli-mata Oran	Bisexual	1	6	3	10

Food & Feeding

Nilgai is strictly vegetarian and is a well known herbivore. It often browses on shrubs and small trees and grazes on grasses and herbs. (Rajpurohit & Mohnot, 1988). They have been observed eating on grasses like Bhurut (*Cenchrus biflorus*), Dhaman (*C. setigerus*), Sewan (*Lasiurus sindicus*), Murut (*Panicum turgidum*), Mot (*Cyperus arenarius*), Tantiya (*Dactyloctenium* spp.); herbs like Bayani (*Tephrosia purpurea*), Siniya (*Crotaleria burhia*), Bui (*Aerva persica*) and leaves, flowers and fruits of many shrubs like Aak (*Crotolaria procera*), Gargania (*Grewia tenax*), Ker (*Cepparis decidua*), Bordi (*Zizyphus nummularia*), Murali (*Lycium barbarum*) and on small trees like, Kankero (*Maytenus emarginatus*), Gundi (*Cordia gharaf*), Kumat (*Acacia senegal*), Khejari (*Prosopis cineroria*). Vilayati babul (*P. juliflora*), Babul (*Acacia nilotica*), Dhok (*Anogeissus pendula*) and Mithi Jal (*Salvadora persica*) (Table II).

In addition to this it often raids the crops jumping across 6-7 feet high stone wall or fencing made to protect the crops from wild and domestic crop raiders. Mostly it raids the fields early in the morning, evening and at night. Nilgai spend substantial time in the crop fields during night but could not be directly observed during this time. Indirect evidences such as hoof marks, droopings

and crop damage (plants with extensive feeding signs, lot of injuries by trampling, broken or uprooted ones) clearly indicate the presence of nilgai in crop fields from dusk to dawn. Our observation and according to questionnaire from farmers there is no clear food preference and devore every kind of farm crops and vegetables but avoid Raira (*Brassica juncea*). The common kharif crops (grown in July - August, depending upon monsoon) are : Bajra (*Pennisetum typhoidenum*), Jowar (*Sorghum vulgare*), Maize (*Zea mays*), Gwar (*Cyamopsis tetragonoloba*), Mung (*Phaseolus aureus*), Moth (*P. aconitifolious*), Til (*Sesamum oriantale*), Castor (*Ricinus communis*) and Kapas (*Gossypium sp.*) on the other hand Rabi crops (grown in Nov. and Dec. which are irrigated) are : Wheat (*Triticum vulgare*), Chana (*Cicer arietenum*), Saranso (*Brassica compestris*), Rai (*Brassica juncea*), Piaj (*Allium cepa*), Garlic (*A.. sativum*), Chillies (*Capsicum annum*), Dhania (*Coriandrum sativum*) Jeera (*Carum nigrum*), Sounf (*Foeniculum vulgare*), Potato (*Solanum tuberosum*), Tomato (*S. esculantum*), Brinjal (*S. melogena*), Bhindi (*Hibiscus esculentus*), Mooli (*Raphanus sativus*), Carrot (*Daucus carota*), Gobhi (*Brassica aleracea*), Methi (*Trigonella foenum*), Matar (*Pisum sativum*), Palak (*Spinacea oleracea*) and Shakerkand (*Ipomea botates*). It has been observed that eating less but destroying more by trampling and causing damage the crops grown in this area and are therefore regarded as serious mammalian pest and are competing for resource utilization with domestic live stock (Ghosh *et al.*, 1987) and farmers wants to get rid of this unconventional pest. Although they also feed on all the available vegetations outside the crop field. Of course in dry season they raid more frequently as there is nothing to eat outside the irrigated fields.

Table II : List of plants of which leaves, flowers, fruits are used by nilgai, *B. tragocamelus*.

S.No.	Botanical name	Common name	Nature	Part eaten by Nilgai
1.	*Cenchrus biflorus*	Bhurut	SG	Whole
2.	*C. setigerus*	Dhaman	SG/AG	Whole
3.	*Lasiurus sindicus*	Sewan	SG	Whole
4.	*Dactyloctenium sp.*	Tantia	SG	Whole
5.	*Panicum turgidum*	Murut	SG	Whole
6.	Ziziphus numularia	Bordi	S	Leaves
7.	*Maytenus emarginatus*	Kankero	T	Leaves
8.	*Salvadora persica*	Mitha Jal	T	Leaves, Fruits
9.	*Prosopis cineraria*	Khejri	T	Leaves, Pods
10.	*P. juliflora*	Vilayati Babool	T	Leaves, Pods
11.	*Acacia nilotica*	Deshi Babool	T	Leaves
12.	*A. senegal*	Kumbat	T	Leaves
13.	*Euphobia caducifolia*	Thor	S	Leaves
14.	*Capparis decidua*	Ker	T	Young shoots, Fruits, Flowers
15.	*Cordia gharaf*	Goondi	S	Leaves
16.	*Commiphora wightii*	Guglani	S	Leaves
17.	*Aerva persica*	Bui	PH	Whole
18.	*Tephrosia purpurea*	Biyoni	PH	Whole
19.	*Calotropis procea*	Aak	S	Leaves
20.	*Cynodon dactylon*	Doob	SG	Whole
21.	*Crotalaria burrhia*	Sıniya	PH	Whole
22.	*Lycium barbarum*	Murali	S	Leaves

SG=Seasonal grass; PH=Perrenial herbs; S=Shrubs; T=Trees.

The farmers chase them away by just following them by making loud sound by crackers or air gun fires, following through tractors, sound of empty tin by beating or dried pumpkin filled with small stones and connected with strings. The most common protection strategy for farmers is to guard their fields by remaining vigilant whole night during the crop season.

Recommendations : We can use to any of the following techniques to mitigate the crop-damage problem though they are not long-term solutions but could minimise the damage up to some extent (Chauhan & Sawarkar, 1989; Schultz, 1986).

- Corrals (enclosures) : To segregate sizeable population of nilgai, the need for enclosing the animals in certain selected forest patches identified as their known habitats, is proposed. Further experiment with chemical contraception of the fenced animals in order to reduce reproduction rate.
- Translocation : Animals could be translocated to wildlife sanctuaries from where they seen overcrowded.
- Trenching : Trenching around crop fields may also be used to mitigate crop damage.
- Power fencing : Power fences are purely psychological barriers. The impulse causes a sudden muscular contraction which the animal experiences as unpleasant and frightening.

The observation suggests that the electric fencing/power fencing is not a good solution since many farmers can not afford it. Therefore, the cheapest and the most effective way to control nilgai population would be culling and regulated hunting which will generate revenue for further management and conservation of nilgai.

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