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DIAGNOSTIC CHARACTERS OF NILGAI (B.TRAGOCAMELUS) PREDATORY COMPLEX AND THEIR GRAZING IMPACTS ON FOOD PLANTS

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ABSTRACT:
Grazing and browsing on cultivated crops are two important factors which causes loss in economy of the village people. Damage to the cultivated crops was caused not only due to gazing and browsing but also due to trampling, resting and movement of Nilgai which altogether destroy the standing crops. In browsing behaviour, the crops have a chance to grow but give least yield to the farmers *Boselaphus tragocamelus* Pallas,(1766), commonly called Nilgai or blue bull, a largest antelope, endemic to the Peninsular Indian and Indus divisions of the Indian Subregion in the Asia includes the foothills of the Himalayas in Nepal (Dinerstein 1980).

INTRODUCTION

Boselaphus tragocamelus is sexually dimorphic. The neck deep and compressed; tufted tail reaching hocks; hind limbs shorter than front limbs with high withers (Prater 1980); pre-borbital gland small with no lachrymal fossa; inter digital and unguicular glands present but no inguinal glands (Gosling 1985; Pocock 1910); adult males dark gray but varying from bluish to brownish gray except mane, terminal one –half of the ear outside and 2 spots inside, and tip of the tail , abdomen, and 2 rings above and below the fetlock are white. Females, calves, and young males have a pronounced “pennant” or beard of coarse hair directly beneath the gular patch, it is rudimentary in females. Both sexes have a short and bristly mane that extends the length of the neck and terminates in tuft at the base of the neck. During resting in the cultivated field, this animal opens the field and made the gap between crops (Fig 11). During and after monsoon their visit to the crop field decreases considerably and in the normal circumstances they also keep themselves away from crop fields.

The percentage of impact on various cultivated and natural food crops due to grazing were studied from the five districts of North Bihar which are presented in the table 1,

Table 1 : showing the average percentage of damage due to grazing on various cultivated and natural crops studied in five districts of North Bihar.

Sl.No.	Cultivated crops	Damage due to grazing	
		Damage (%)	Damage (Range)
1.	Coriander	92.22	85-95
2.	Cabbage	83.35	80-90
3.	Wheat	82.11	70-88
4.	Tomato	78.45	75-85
5.	Maize	69.23	60-75
6.	Banana	57.85	55-65
7.	Sugarcane	53.44	50-65
8.	Moong	51.33	45-55
9.	Kakri	41.75	40-55
10.	Papaya	32.34	35-45
11.	Chana	21.98	20-30
12.	Chillies	0.00	0-0
	Natural crops	**Damage due to grazing**	
1.	Pipal	8.55	5-10
2.	Babool	15.51	10-20
3.	Bamboos	11.98	10-15
4.	Litchi	8.15	10-13

Predatory complex:-

Lack of predatory animals of Nilgai leades to over population in some of the Indian states viz., Rajsthan., Gujarat., Haryana, Punjab, Madhya Pradesh and Uttarakhand (Chouhan, 2011). Goyal and Rajpurohit (1999) reported that the mass killing of Nilgai (Blue bull), *Boselaphus tagocamelus*, in some village like parasala and Osian of jodhpur. Besides, crop-raiding by locally over abundant populations of Nilgai (*Boselaphus tragocamelus*) has been widely reported in many parts of the country. Due to prolonged breeding activity and lacks of potential predators, numbers of Nilgai have increased considerably and become locally over abundant in the above mentioned states particularly in the study area (five districts of North Bihar). During the present observation there were no predators of Nilgai observed from five districts of North Bihar.

Population density:-The density of Nilgai population was studied by various workers from India and in abroad. Pandey (1988) studied the population densities of Nilgai from lndravati National Park, as 0.23-0.34 individuals/km^2. Berwick (1974) and Berwick and Jordon (1971), Khan (1977) and Khan et al., (1996) studied the population densities of Nilgai from Gir Lion Sanctuary as 0.39-1.47 individuals/km^2. Biswas and Sankar (2002) have also recorded he density of Nilgai from Pench Tiger Reserve as 0.40 individuals/km^2. Awasthi ***et al.*** (1994) and Mathai (1999) recorded the density of Nilgai as 0.44-7.81

individuals/ km² from Panna National Park. Bagchi *et al.* 2004 observed the density as 6.60-11.36 individuals/km² and 7.0 individuals/km² from Ranthambhore and Keoladoe National Park respectively.
In Nepal, Dinerstein (1980) studied the population density of Nilgai from Royal Karnali-Bardia Wildlife Reserve, and the densities were 3.2 individuals/km² during the hot-dry season and 5.0 individuals/km² in April. In southern Texas, densities of a population in about 10,000 ha of fenced private property were 3.05-4.04 individuals/km' and 3.74-4.76 individuals/ km² from helicopter and ground surveys, respectively (Brown 1976:56).

In the present investigation the population density of Nilgai were studied from five district of North Bihar viz., Sitamarhi, Muzaffarpur, Darbhanga, Samastipur and Vaishali. The district Muzaffarpur is the best district for Nilgai as they have the density of 5.0

individuals/km' followed by Darbhanga 4.0 individuals/km', Sitamarhi 3.5

individuals/km², Vaishali 3.0 individuals/km². The district Samastipur is the least density 2.5 individuals/ km² as the district Samastipur has mainly coriander and sugarcane crops , -
was not widely cultivated by the people as the sugarcane act as a hidden place during -
feeding when the village people noticed the presence in the field. Thus it clearly shows from the above observations that the density of Nilgai is mainly depend on the availability of preferred food plants, shelter, and availability of water sources followed by the distance of villages from the agriculture field.

The maximum life span of *B. tragocamelus* is about 12-13 years in the wild (Berwick 1974; Mungall 2000; Mungall and Sheffield 1994) and 20-21 years in captivity (Grzimek 1990; Jones 1982). The survival patterns among male and female *B. tragocamelus* are similar to those of other ungulates (Brown 1976) but vary depending on population density and status of particular populations, either on native or introduced range (cf. Berwick 1974; Sheffield et al. 1983). High rates of mortality are common for males in particular, but also females, before age 3 (Berwick 1974; Brown 1976). In Gir Forest, India, 34% of calves die each year, and there is a general linear decline of 52% of 2-10-year-olds of both sexes (Berwick 1947). This animal is protected under the Wildlife Protection Act,1972.

Generally Nilgai lives in two groups, the bisexual herds and all bull herds. The territories and home ranges are neither well defined nor defended. Although, there movement are restricted within a specified area beyond which a particular bisexual herd does not move out but the present study observed that shifting of animals from one place to another depending upon the availability of food resources as studied by Agnihotri (2001). Female Nilgai were observed very aggressive when their calves were disturbed by any other species like dogs, goats etc. Nilgai have the habit of resorting to the same spot to deposit their droppings.

Nilgai after leaving the night resting site herd moves to foraging grounds after a stay for a while to undertake the social activities. Nilgai are usually more active in the morning and evening and less in the afternoon. Peak feeding is observed during morning

(7.00 to 10am) and in the evening (4.00 to 7.00pm). The *Boselaphus tragocamelus* usually drink water twice in a day, but drinking water depends upon the area, vegetation and seasons of different habitats.

Thus, these animals have very wide moving ranges and their herds move from one place to another and shift their lodgings giving the impression that the Nilgai population is increasing and causing lot of damage. The survey of 5 districts evidently found that these animals are living in and sometimes outskirts of the district, which are single kharif crop areas. During kharif season with the onset of monsoon these animals have fairly abundant vegetation in wild and will probably not raid the crops as they are exclusively herbivorous and fully survive on plant material Chhangani and Purohit (2002).

CONCLUSION

This study also suggests that their preferences for the natural vegetation and to keep it in undisturbed condition are a usual practice. During and after monsoon their visit to the crop fields decreases considerably and suggests that in the normal circumstances they also keep themselves away from crop fields. It is clear from the present data that Nilgai do not want to come in contact with human beings and if they raid agricultural crop and vegetable fields they have to encounter humans and face tough situation not conductive for their survival.

The crop raiding behavior and preferences to certain crop material suggest that this is a recent development since they are diverse feeders. That means they reject plant material for which they have not developed any taste and eat those parts for which they have developed certain taste.

Their population size in the surveyed 5 district does not suggest any alarming situation because of devoid of large predators, small cat and dog. This seems to be a major factor for population increase in nilgai and imbalance in the Agri-ecosystem.

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