

ECOLOGY OF THE FOUR SYMPATRIC HERBIVORES (CHEETAL, SAMBAR, BARKING DEER AND HOG DEER) BASED ON POPULATION DATA (FROM 1977 TO 2008) IN CORBETT TIGER RESERVE RAMNAGAR, UTTRAKHAND.

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ABSTRACT: *Cheetal (Axis axis), Sambar (Cervus unicolor), Barking deer (Muntiacus muntjac) and Hog deer (Axis porcinus) are the four sympatric species of deer found in Corbett Tiger Reserve. The Cheetal is a spotted, beautiful and most abundance species in all four species of deer. There is sexual dimorphism in body size and colouration, males being larger and about 40% heavier than females (70kg vs 50kg) and darker and browner in colour. Sambar largest deer average weight of the male ranges between 225kg and 320 kg and that of the female between 135kg and 225kg. During the rutting season, males become dark brown to brownish black around the neck (in Cheetal), and almost black (in sambar). Barking deer (Muntjacs) small solitary forest living deer, reddish coat, short and pointed tail, the muzzle is rather large and black. There is no noticeable seasonal change in coat colour. Muntjac, breed and give birth in all months of the year and a remarkable exception-males can breed even while their antlers are in velvet (Chapman et al.1997). Hog deer (Panda) is a hider and observed in small numbers in feeding and resting areas. According to the population based study from 1977 to 2008 the no. of population of Hog deer is very small in comparison to other three sympatric herbivores (Cheetal, Sambar and Muntjacs) in Corbett Tiger Reserve.*

KEYWORDS : *Dimorphism, Sore patch, Rubbing, Muzzle, Fawns, Combat, Thrashing, Speckled, Secretive.*

INTRODUCTION : Wildlife plays a significant role in maintaining the ecological equilibrium of nature. Wildlife is important as for their medicinal values for healthy environment, ecological and economic importance, for conservation of biological diversities and recreation etc. Deers are herbivores, form the middle link in a food chain. They gain energy from consuming grass, leaves and are themselves a food source for predators. In Corbett, four species of deers are found, Cheetal (*Axis axis*), Sambar (*Cervus unicolor*), Barking deer (*Muntiacus muntjac*) and Hog deer (*Axis porcinus*) .

SPECIES OF DEERS IN CORBETT TIGER RESERVE

1. Cheetal (Axis axis)- Cheetal also known as spotted deer, the physical appearance of body coated with reddish brown coat and under parts are white. It has white spots all over the body which is the main morphological identification feature of this type of deer. There is sexual dimorphism in body size and

colouration, males being larger and about 40% heavier than females (70kg vs 50kg) and darker and browner in colour. During the rutting season, males become dark brown to brownish black around the neck. Chital avoids habitat extremes such as dense moist forests and open semi-desert or desert. Chital habitat use varies seasonally mainly in response to food availability. Chital use more wooded habitat during the cool-dry season and in early summer (November to May), when fallen fruit, leaf litter and browse are available. In open grassland and tropical dry thorn forest Chital density increases with the onset of monsoon rains and flush of plant growth (Mishra 1982, Moe and Wegge 1994, Khan 1996, Raman et al.1996). Green grass sprouts, emerging after rains or after cutting and burning are especially favoured. In dry season leaves, flowers, fruits of shrubs, trees and climbers (browse) is consumed (Johnsingh 1981, Moe and Wegge 1994, Raman et al.1990).

2. Sambar (Cervus unicolor)- The adult Sambar (largest deer) stands 140-150 cm high at the shoulder. The average weight of the male ranges between 225kg and 320 kg and that of the female between 135kg and 225kg (Lydekker 1916, Crandall 1964, Prater 1980, Downes1983). The winter coat of the Sambar is grey-brown to dark brown, and adult rutting stags appear almost black, appear in October and fully developed by early December (Schaller 1967). Only males have antlers, which in adults, have three tines on each side, and are shed annually. Average antler length is reported to be 95cm from north India and 90cm from South India. Sambar abundance varies spatio-temporally and is largely influenced by the availability of suitable habitat with ample cover, water and lack of disturbance. The diet can be broadly classified into browse and grass (Khan 1994) and the contribution of browse and grass to the diet varies with season: mainly browse in winter and summer, and grass soon after the rains. Sambar were least active at midday. The duration of low activity at midday was short in winter and longer in summer, indicating that changes in temperature affected movement.

In Sambar, the development of sore patch, hard antlers in males, antler rubbing (rubbing and thrashing of vegetation with antlers), wallowing, preening and courtship behaviour may indicate the rut (Johnsingh 1983, Shea et al.1990). The peak of rutting varies from one area to another : October to December (Lydekker 1916, Schaller 1967), November to April (Johnsingh 1983), December to April (Shea et al.1990), January to April (Varman and Sukumar 1993) and December and January (Shankar 1994).

3. Barking deer (Muntiacus muntjac) - Barking deer also called rib-faced deer, small solitary forest living deer, reddish coat of a rather uniform hue. The tail is short and pointed, the muzzle is rather large and black. There are no noticeable seasonal change in coat colour. New borne have a spotted coat, but since they are very small and remain hidden rather than following their mother during the first few weeks of life, one is unlikely to see spotted fawns in the field. Males have antlers with a short brow tine and a simple beam that can reach about 15cm in length and that tend to curve inwards at the tip in older males. Males are equipped with weapons (antlers and tusks) that they use in combat among themselves (Barratte1977) but they are not much larger than females in body size.

Barking deer are likely to be found in most forest habitats that are dense enough to conceal them from a human observer (Powell 1964, Wood 1931). The spatial organisation of muntjacs is rather simple. Females have home ranges that are smaller than those of males and whose size is presumably a function of the abundance and distribution of food. Males have larger home ranges, encompassing those of a few females (Dubast 1970, Chapman et al 1993, Harding 1986). Thus the distribution of female is controlled by food, that of males is a response to the distribution of females. Muntjacs breed and give birth in all months of the year (Chapman and Dansie 1970, Burette 1977, Pei et al.1995). Muntjacs are a remarkable exception-males can breed even while their antlers are in velvet (Chapman and Harris 1991).

4. Hog deer (Axis porcinus)-The Hog deer (commonly known as panda) is a small solitary species typically inhabiting moist tall grasslands of Cobett. Behaviourally the hog deer is a hider and although, it may be observed in small numbers in feeding and resting areas, when danger threatens, it acts as an individual. The

coat of the hog deer is subject to seasonal change, in summer, it ranges from a light brown to a rich, reddish brown with a line of parallel white spots running along both sides of a dark dorsal stripe. The upper parts of the forelegs are very dark, almost black in individual stags, but not in hinds. The throat underbelly and insides of the legs are light in colour, tending to white in individuals the white extending up under the tail.

A section of the outside of the tail is coloured a light brown or tan in the summer coat. In winter coat colour changes to darker brown with a speckled appearance and results from three distinct bands of colour on each hair. Fawns are brightly spotted at birth, but the spots fade progressively and by the time the fawn is about 9 weeks old, the spots are no longer visible. The stag's antlers are normally three-tined, the brow tine forming an acute angle to the main beam.

METHODOLOGY:

STUDY AREA : The Corbett Tiger Reserve, Ramnagar is used as the study area . The total area of Corbett Tiger Reserve is 1288.32 sq. km in which Corbett National Park 520.82 sq. km, Sonanadi Wildlife Sanctuary 301.18 sq. km and Reserve Forest 466.32 sq.km. The Jim Corbett National Park (1936) famous for its wide varied wildlife and beautiful location in the foothills of the Himalaya. Its topography in Shivalik foothills altitude 400 mt-1200 mt, longitude-78°33'E-78°46'E, latitude: 29°13'N-29°35'.

COLLECTION OF DATA : The official data of deers population had been collected from Corbett Research Range Office (Shodh range) Ramnagar. The data is in the form of total no. of population of Cheetal, Sambar, Barking deer and Hog deer. The data from 1977 to 2008 (in between 16 year) were analysed (Table 1). Other Secondary data from books, journals, websites etc. are used for study in this paper .

RESULT AND DISCUSSION :

Year	No.of Cheetal	No.of Samb ar	No.of Barking deer	No. of Hog deer
1977	9100	1650	950	1125
1978	12100	2200	300	430
1979	12200	2250	690	550
1980	13000	2500	750	525
1981	14528	2658	710	528
1982	14730	2676	720	531
1983	11986	2255	810	76
1984	14663	2654	916	100
1985	13243	2459	787	151
1986	14740	2156	965	159
1987	16801	2405	993	188
1988	15906	2627	1082	85
1989	19064	2816	1213	127
1990	18222	2302	1056	135
1991	21462	2011	1056	173
1992	21199	3200	858	210
1993	23497	3265	1119	274
1995	26315	3778	1324	291
1997	26390	3816	1337	424
1999	25821	2935	910	323
2001	24836	2622	852	294
2003	25822	2640	854	447
2005	26765	2495	928	161
2008	27161	1900	736	225

Table 1. Population of deer species found in Jim Corbett National Park Ramnagar, Nainital Uttarakhand

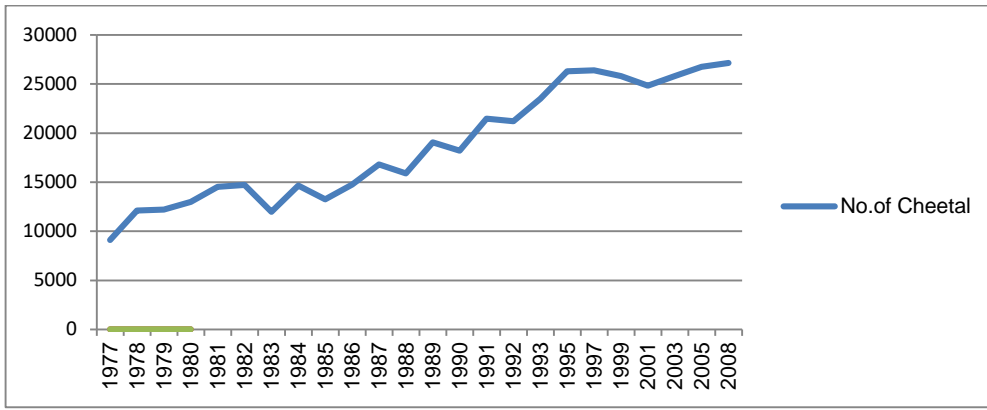


Fig.1 Cheetal population in Jim Corbett National Park from 1977 to 2008.

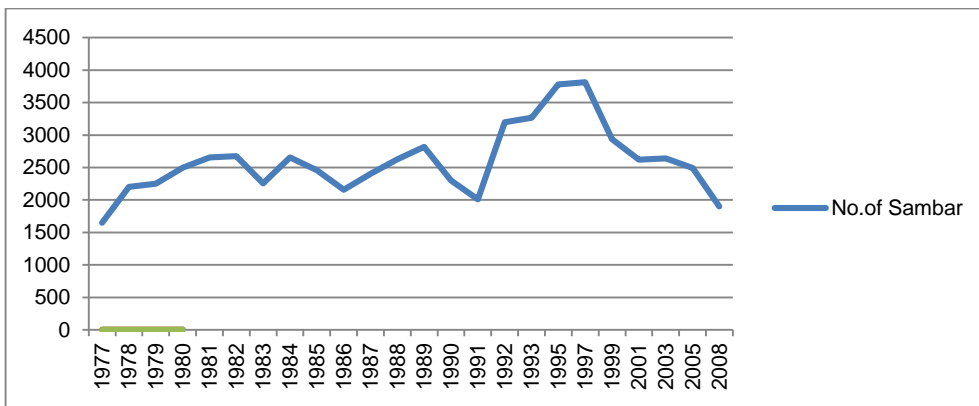


Fig.2 Sambar population in Jim Corbett National Park from 1977 to 2008.

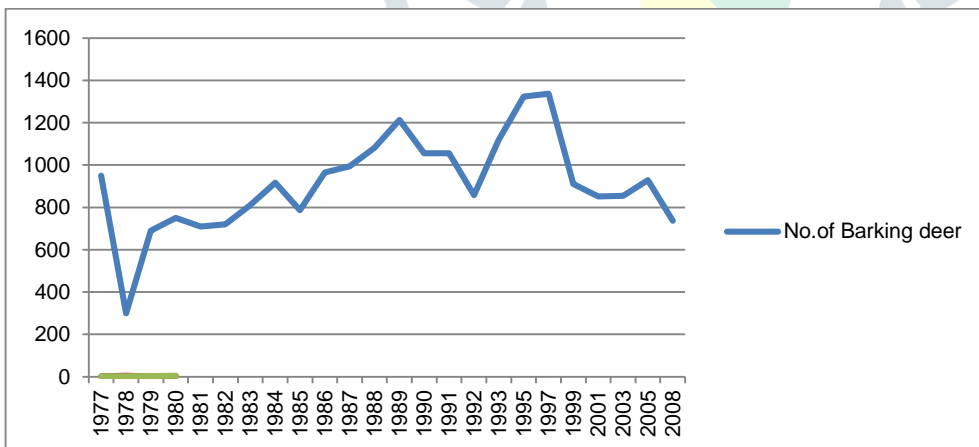


Fig.3 Barking deer population in Jim Corbett National Park from 1977 to 2008.

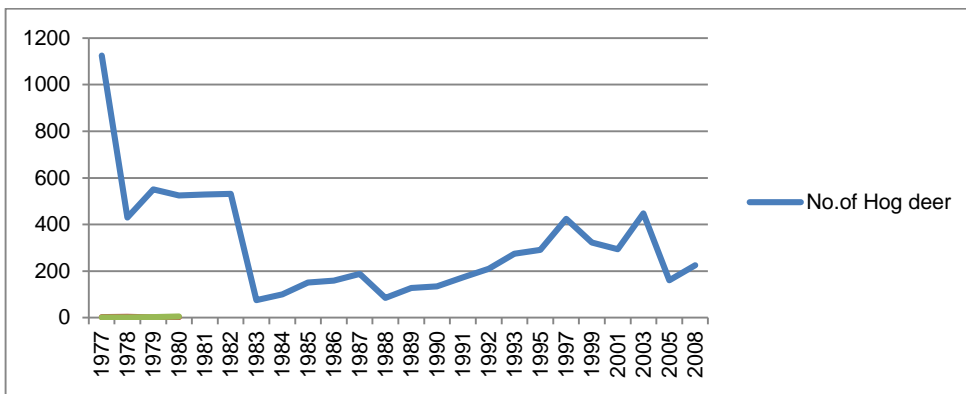


Fig.4 Hog deer population in Jim Corbett National Park from 1977 to 2008.

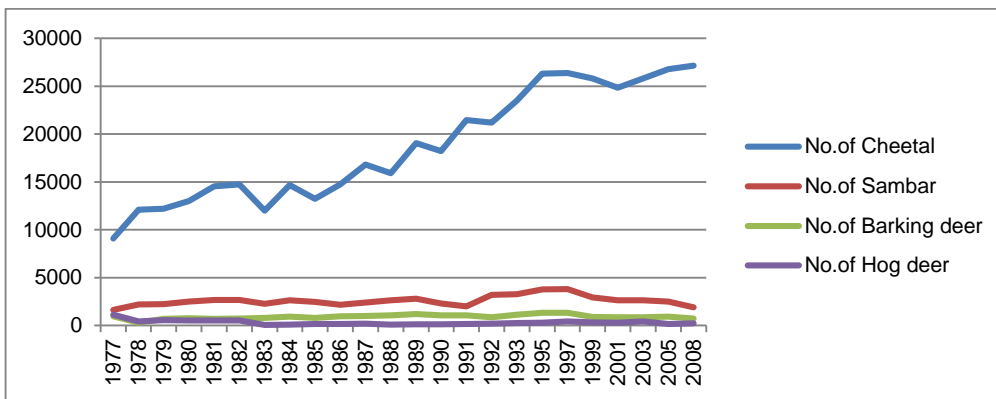


Fig.5 Graph showing comparative population of all four species of deers in Jim Corbett National Park from 1977 to 2008.

1.The figure.1 shows that there is increase in population of cheetal from 1977 to 2008. And the figure.2 shows that the sambar population is also increase and the peak is found in 1997.

2.The figure.3 shows that the population of barking deer increase in study period. The figure.4 shows that the population of hog deer is decrease in the study period (1977 to 2008).

3.The figure.5 shows the comparative population of all species of deers Cheetal, Sambar, Barking and Hog deer in Jim Corbett National Park.

CONCLUSION:

This study concluded that the Cheetal is the most abundance species of deer found in Jim Corbett National Park. And it is easily available for study. Sambar is the second most abundance species in between all four species of deer in Corbett. And barking deer and the hog deers are found in very small no. of population. The barking deer (muntjac) is a secretive animal, difficult to study in the wild and of very little economic importance also.

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