

# Behavioural Correlates of Predation by Tiger (Panthera tigris) & Leopard (Panthera pardus) in Corbett Tiger Reserve, Ramnagar UK. India

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**Abstract:** *Nature is very clever and full of miracles. It maintains and manages each and everything (living & non living) on this planet earth very wisely, nicely, smoothly and systematically. Existence of such creatures depends mainly upon two factors viz. nature (force of natural selection) and use/disuse of natural resources by man, presently the supreme creature ruling the planet<sup>1</sup> and manipulating the ecosystem deliberately or ignorantly as per his own will to fulfill his selfish and shortsighted desire. The food and feeding behaviour<sup>2</sup> of both big cats are different, tiger is not so furious than leopard while tiger is more intelligent than man. Leopards have very good quality of feasible habit with surroundings even in human-dominated area. For predation habit the scat analysis technique as a methodology had been chosen for this study.*

**Keywords:** Feeding behaviour, Feasibility, scat analysis, predation

## 1. Introduction

Leopard (Panthera pardus), is short having less weight in rest of tiger (Panthera tigris) having the weight ( 135-230 kg). On the hand the leopard carry only 39-68 kg. Leopard hunts on smaller prey<sup>3</sup> and hauling the carcasses up tree and preyed upon Langoor, dog, goat, etc more but tiger preyed upon larger prey like Cheetal, Samber, wild boar etc as per his diet requirement. Leopards have habit to dwell in human dominated areas in search of easy prey like domestic animal. On the other hand tiger move rarely or for vital need under ecological stress.<sup>4</sup> In Corbett near the Gujjar Deras movements are very common and livestock predation will take place every months which leads the conflict & loss of both side i.e. man & big cat. The negative movement of tiger from core to buffer or in human- dominated landscapes due to vital need under any kind of ecological stress for food, prey, genetic viability etc. Total 140 scats of leopard and 149 scats of tiger were collected for this study in year of 2014-15.

## 2. Materials and Method

Tiger and Leopard scats were the main materials for this study.

**Study Area:** Corbett Tiger Reserve is situated in the Bhabar tract of Siwalik formation at altitude of 400-1200 m. vital statistic of Corbett is Area 1318.54 sq.km Core-520.82 sq.km.) Sonanadi Wildlife Sanctuary -301.18 sq.km) Reserve forest 496.84sq.km. Altitude 400 ml-1, 2010 m above mean sea level. The Rāmgangā river enters the reserve from the northeast and after several zigzag turns emerges out from the southwest. The Palain, Sonanadi, Mandal, and the Rāmgangā rivers are the major perennial water bodies of the reserve that contain water all year round. On the other hand Kosi River formed the eastern boundary of the Reserve.<sup>5</sup> Corbett is surrounded by 5 Forest division i.e. Ramnagar forest division, Lansdowne forest division,

Garhwal forest division, Tarai West forest division, and Bijnor forest division.

**Study Materials:** Leopard scats from Corbett Landscape with the help of staff and during field work. The period of collection of scat extends June 2014 to May 2015. Total 140+149 scats were analyzed for the study of undigested remains. By preparing the hair impression slide identification of prey species were identified and reconstructed the leopard diet. Scats were collected from Corbett zhirna zone, Dhikala zone and core of Corbett with the help of Corbett official staff.

**Methodology** Leopard scats are found to be less coiled and having larger distance between two successive constrictions within a single piece of scat, when compared to leopard which were mostly coiled and have similar distance between constrictions.<sup>6</sup> In nature it is very difficult to see the tiger to kill its prey even we cannot track to out skirt the killing of prey. Some time by luck it happened. By indirect method through the collection of scats containing hair as undigested remains which will reveal the animal preyed upon by the tiger and leopard.

**Procedure-** As described by Koppikar & Sabnis (1976)<sup>7</sup>. The method was slightly modified in the present investigation. Very first all hair specimens were properly washed in Luke worm water, and then passed through ether or xylol. The fresh slides were smeared with colourless nail polish/ ethyl lactate ( having refractive index close to glass slides) then sorted hairs (1or 2 ) were passed and kept straight on the smeared slide with the help of forceps. Just after 7-10 minutes the hair was peeled out from the smeared slide and impression of hair observed on the smear slides under compound microscope. Gross appearance, hair length, diameter, and colouration were noted and actual photographs were taken in three different regions of the hair impression on high power (400X) of the microscope, which were used as a key for the identification of a carnivore's diet and feeding habit

**Calculation of biomass**

The biomass consumed per animal/ day was calculated (Sabnis, 2004)<sup>7</sup> by using the formula -

$$C = \frac{T}{N \times n}$$

Where,

C= Biomass consumption

T= Total biomass in kg (determined from hair remains in each scat)

Observation of one type of hair indicates one animal consumed/ killed. Two different types of hairs indicate two different types of animal consumed/ killed. The ideal weights of these animals are considered for biomass calculations).

N= Number of scats collected  
 n= Number of animals consumed/ killed.

**3. Result**

Result depicts the critical condition of prey biomass. The result of scat analysis of tiger and leopard shown in Table wise. The study reveals the total 7prey species are found in scats as remains. But overall per day consumption and annual consumption of both the big cats are very less & not fulfilling the vital and ecological need<sup>8</sup>. At least 4-5 kg per day requirements for tiger and 3-4 kg for leopard are needed to wild survive. But here we have to think about the prey biomass in Corbett at any rate. Prey biomass is an important and vital factor directly concerned with ecological need of tiger and other wild animal.

**Table 1:** Percentage occurrence of undigested remains recorded in the leopard scat from Corbett and its periphery

Sr. No	Prey species	No. of animals	% occurrence	Animal weight Considered ( kg)	Biomass ( kg)	% Biomass
1	Semnopithecus- entellus(langur)	27	17%	21	567	4%
2	Axis axis ( Cheetal)	34	22%	85	2890	19%
3	Cervus unicolor ( Samber)	23	15%	270	6210	5%
4	Sus scrofa (Wild boar)	18	11%	230	4140	27%
5	Hog Deer	15	9%	55	825	5%
6	Macaca Mulata	26	16%	12	312	2%
7	Hystrix indica ( Porcupine)	15	9%	18	270	2%
	Total	158			15214	

(Considered weight of animal in kg according to Vivek Menon-A field guide to Indian mammals &Prater- Book of Indian mammals)

**Table 2:** Daily consumption by Leopard (Panthera pardus) in Corbett and its periphery-

Formula	Total biomass of Faecal contents in Kg ( T )	Year and number Of scats	No. of animals	Daily consumption in Kg.
$C = \frac{T}{N \times n}$	15214	2014-2015 158	158	.0609 kg/day

**Daily consumption (c)**

$$C = \frac{T}{N \times n} = \frac{15214}{24964} = 0.609 \text{ kg. / day / Leopard}$$

**Annual Consumption**

$$0.609 \times 365 = 222.28 \text{ Kg.}$$

**Table 1:** Percentage occurrence of undigested remains recorded in the Tiger (Panthera tigris) scat from Corbett and its periphery

S.No	Prey species	No. of animals	% occurrence	Animal weight Considered ( kg)	Biomass ( kg)	% Biomass
1	Semnopithecus- entellus(langur)	10	7%	21	210	1%
2	Axis axis ( Cheetal)	37	25%	85	3145	14%
3	Cervus unicolor( Samber)	27	18%	270	7290	32%
4	Sus scrofa(Wild boar)	25	17%	230	5750	26%
5	Blue bull	18	12%	288	5184	23%
6	Hog Deer	20	13%	55	1100	5%
7	Hystrix indica ( Porcupine)	12	8%	18	216	1%
	TOTAL	149			22895	

Considerer wt of animal in kg according to Vivek Menon: A field guide to Indian mammals and Prater-Book of Indian mammals.

**Table 2:** Daily consumption by Tiger (*Panthera tigris*) in Corbett-

Formula	Total biomass of Faecal contents in Kg ( T )	Year and number Of scats	No. of animals	Daily consumption in Kg.
$C = \frac{T}{N \times n}$		2014-2015 149	149	1.03 kg/day

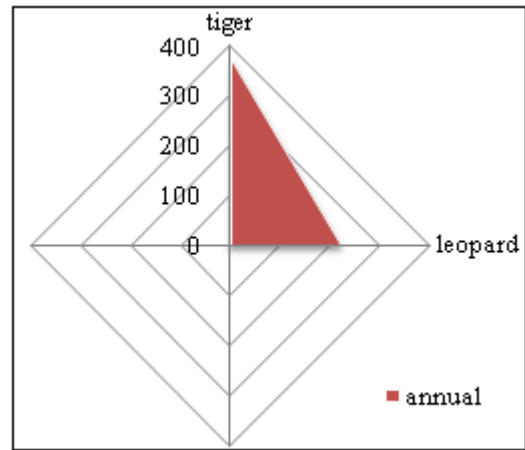
**Daily consumption (c)**

$$C = \frac{T}{N \times n} = \frac{22895}{22201} = 1.03 \text{Kg. / day / Tiger}$$

**Annual Consumption:** 1.03 x 365 = 375.95 Kg.

**4. Discussion**

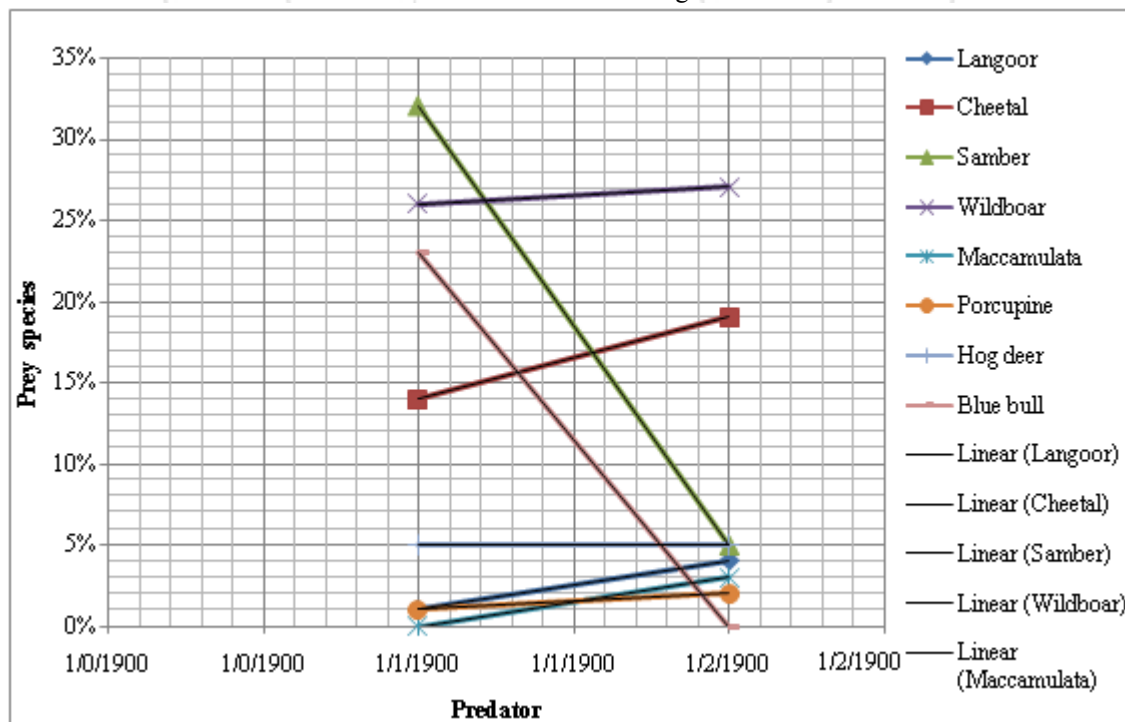
Study shows that less prey biomass is available in the area. Per day diet and annual consumption<sup>9</sup> of prey biomass indicates very less amount which is not up to level of vital and ecological need of tiger and leopard. Leopard



**Figure 1:** Graphical presentation as comparison of prey biomass consumption

**5. Conclusion**

The study depicts the 7 prey species for Leopard and 8 prey species for Tiger. Undigested remain of these prey species calculated in biomass consumption<sup>10</sup> with its percentage. It reveals the negative aspects of vital<sup>11</sup> and ecological need. So a serious effort for the conservation<sup>12</sup> and breeding of prey base biomass is highly recommended in Corbett Tiger Reserve. In future perspective more chances of conflict,<sup>13</sup> movement of big cats in human dominated area are very possible. And situation will be critical to both man & wildlife. So prey species like Hog deer nursery is recommended to conserve the species and prey base for tiger etc. Tiger need at least 18-25 kg prey base in habitat<sup>14</sup>. Such type prey base is good for tiger to consume soon rest of other big one like blue bull etc.



**Figure 2:** Over all Biomass consumption % of Tiger & Leopard

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