

# Mammalian Fauna of Dharamshala and its Suburbs of District Kangra, Himachal Pradesh, India

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## ABSTRACT

Dharamshala is a hill area which lies at the feet of the Dhauladhar range. Studies on the mammalian fauna of Dharamshala and its suburbs of District Kangra, Himachal Pradesh, were carried out during different seasons of the years from 2012-2020. After the selection of the study area, the investigations regarding the present study were done by using direct and indirect methods. The direct methods include the visual sighting of the animal species, whereas the indirect methods include footprint and faecal matter study of the animals. The present study showed the presence of 23 species of fauna belonging to 23 different genera, 17 families and seven orders. A maximum of 8 species have an association with Order Carnivora, followed by order Artiodactyla with five species, Rodentia with four species and Primate and Lagomorpha with two species of each of the order. Insectivora and Chiroptera with single species from each order were observed in the Dharamshala region. It has been observed that the maximum no. of mammalian species i.e. 17 species in Dharamshala and its suburbs, are placed under Least Concern by International Union for Conservation of Nature (IUCN, 2013) whereas one species has been categorized as endangered, two species are vulnerable, and three species have been declared threatened by IUCN.

**Keywords:** Dharamshala, Himachal Pradesh, Kangra, Mammalian fauna.

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## INTRODUCTION

The present study area of Dharamshala city is the headquarter of district Kangra. Dharamshala is a hill station that lies in the foothills of the Dhauladhar, 18 km North-East of Kangra. Dharamshala lies at 32°13'8.55" North latitude and 76°19'24.25" East longitude (Figure 1). It lies at an altitude of 1,457 m. It is thickly covered with oak trees and conifer trees, and snow-clad mountains encircle three sides of the Dharamshala town while the valley region stretches in the front of the town. Temperature ranges from 0°C to 38°C. It is the rainiest place (ranging between 1290 mm to 1380 mm) in Himachal Pradesh.

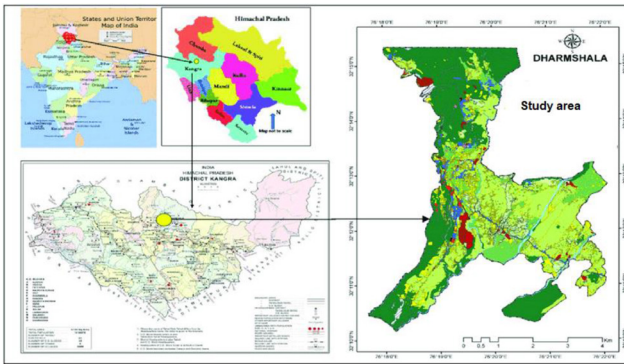
Mammals are one of the fascinating groups among vertebrates. There are 6,399 existing species belonging to 1,314 genera, 167 families and 27 orders throughout the world,<sup>[1]</sup> whereas in India, 427 extant species of mammals belonging to 199 genera, 52 families and 14 orders have been reported.<sup>[1-3]</sup> According to Wilson and Reeder<sup>[4]</sup> about 5416 species of mammals under 154 families and 29 orders have been mentioned from the planet Earth. In Indian Himalayas, around 291 species belonging to 39 families and 13 orders have been recorded,<sup>[5]</sup> whereas Sharma and Saikia<sup>[6]</sup> reported 111 mammalian species from Himachal Pradesh. Himachal Pradesh, with a geographical area of 55,673 sq.km, which is only 1.7 percent of the total geographical area of India, reports the presence of 112 species.<sup>[7]</sup> 16 species of mammals have been reported from Kalatop-Khajjiar Wildlife Sanctuary<sup>[8]</sup> and 13 species from Prashar Lake of Mandi district and its surrounding area,<sup>[9]</sup> while 23 species of mammals have been studied from Rakchham-Chhitkul Wildlife Sanctuary.<sup>[10]</sup>

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**Figure 1: Study area Dharamshala, Kangra, Himachal Pradesh.**

## MATERIALS AND METHODS

For the present study, various habitats of the vertebrates like a lake, forest, pastures, tea gardens, agricultural fields, human habitations, trees and marshy areas of Dharamshala Distt. Kangra, Himachal Pradesh were selected. The study was based on some parameters like time frame, resources, and weather climatic conditions so as to get the maximum and accurate data related to the vertebrate fauna of the study area. The sampling of the vertebrate population has been done by using a combination of some direct and indirect methodologies. The direct methods involved close and far sightings of the animals and their habitats, and indirect methods were based on the study of passive evidence such as faecal pellets count, scats, pug marks, carcasses and hoof marks in different types of habitat. The active evidences of vertebrates were collected by visual sighting methods in different types of vegetation and habitat types. The passive evidence, such as faecal pellet counts, scats, pug marks etc. was also taken into account for analyzing the presence and status of vertebrates in the study area. The vital data related to small vertebrates was collected by common trapping methods for capturing and studying the rodent's species alive. Sherman traps were used in different types of habitats after taking required morphological measurements and photographs of captured vertebrates. The visual sighting method was used to collect direct evidence of medium-sized and large mammals in various vegetation/habitat types. Scats and pellets were also used as indirect evidence to assess the presence and all parameters status of mammals in the study area. The data on small mammalian species was gathered using a common trapping method. Captured specimens/animals were released after morphological measurements were taken.

## RESULTS

The mammalian fauna of Dharamshala and its suburbs (Figure 2) witnessed the presence of 23 species which belonged to 23 genera, 17 families and 7 orders. The maximum species of order found was Carnivora, whose number was 8 followed by Artiodactyla, 5 species and Rodentia, 4 species. Further, Primates and Lagomorpha both had 2 species. Lastly, Insectivora and Chiroptera were having 1 species each (Table 1). Interpretation and analysis of data made things clear that the family Bovidae, Cercopithecidae, Canidae, Mustelidae, Cervidae and Muridae have 2 species each. It has been observed that maximum number of mammalian species i.e. 17 species in Dharamshala and its suburbs are placed under Least Concern by International Union for Conservation of Nature IUCN<sup>[12]</sup> whereas 1 species *Semnopithecus ajax* has been categorized as endangered, 2 species *Ursus thibetanus* and *Rusa unicolor* are vulnerable and 3 species *Panthera pardus*, *Naemorhedus goral* and *Hemitragus jemlabicus* have been declared threatened by IUCN.

21 Species have been classified and placed under various Schedules of the Indian Wildlife (Protection) Act, 1972. Schedule I having only one species i.e. *Hemitragus jemlabicus*, Schedule II comprising a maximum number of 10 species namely *Macaca mulatta*, *Semnopithecus ajax*, *Vulpes vulpes*, *Canis aureus*, *Martes flavigula*, *Mustela sibirica*, *Ursus thibetanus*, *Herpestes* sp., *Paradoxurus hermaphroditus* and *Hystrix indica*, whereas Schedule III comprising 4 species namely *Muntiacus muntjac*, *Rusa unicolor*, *Naemorhedus goral* and *Sus scrofa*, 4 species come under Schedule IV namely *Pteropus* sp., *Funambulus palmarum*, *Lepus timidus* and *Ochotona roylei* and Schedule V comprising 2 species *Rattus rattus* and *Mus musculus*.

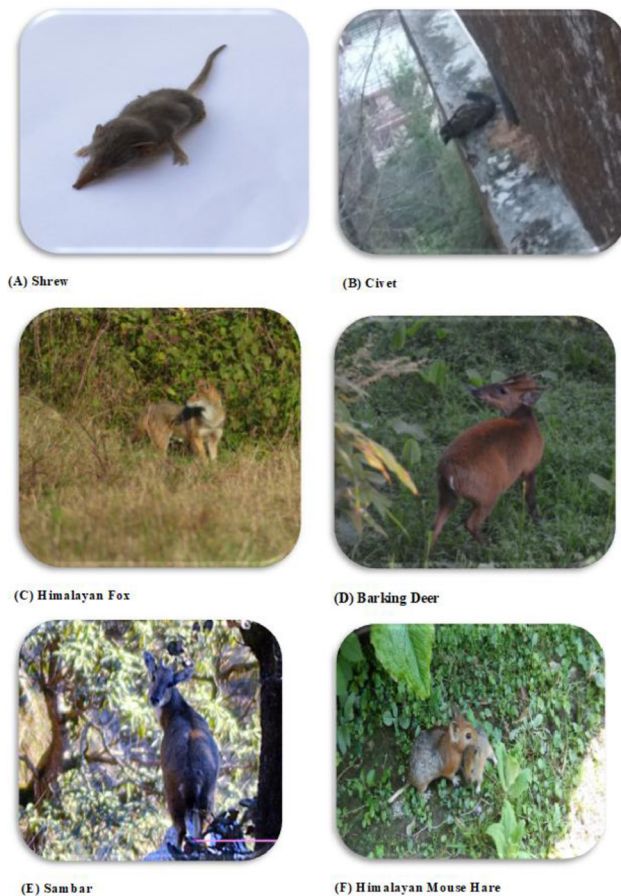
## DISCUSSION

Himachal Pradesh covers only 1.7% of the total geographical area of India and gives shelter to around 27% of the species of mammals in India. The current study represents the corresponding portion of a few earlier studies carried out on mammalian species from different areas of Himachal Pradesh. Sharma and Saikia<sup>[6]</sup> described 21 mammalian species belonging to 19 genera and nine orders from the Simbalbara wildlife sanctuary. 28 species of bats under 14 genera and 5 families were reported from Himachal Pradesh by Saikia *et al.*<sup>[12]</sup> A total of 16 species of mammalian fauna belonging to 14 genera, 12 families and 6 orders were reported from the Khajjiar area of the Chamba district.<sup>[8]</sup> Singh *et al.*<sup>[9]</sup> reported 13 species of mammalian fauna belonging to 13 genera, 12 families and 6 orders from Prasher Lake and its surrounding

**Table 1: Systematic list of Mammalian Fauna observed in the Dharamshala region of Himachal Pradesh.**

| <b>Order: Insectivora Family: Soricidae</b>    |  |                          |                   |                  |
|--|--|--------------------------|-------------------|------------------|
| Sl. No.  | Scientific and Common Names                          | Conservation Status      |                   |                  |
|  |  | IUCN (Red list Category) | IW(P)A (Schedule) | CITES (Appendix) |
| 1.   | <i>Suncus murinus</i> (House Shrew)                  | Least concern            | -                 | -                |
| <b>Order: Chiroptera Family: Pteropodidae</b>  |  |                          |                   |                  |
| 2.   | <i>Pteropus</i> sp. (Indian Flying Fox)              | Least concern            | IV                | II               |
| <b>Order: Primates Family: Cercopithecidae</b> |  |                          |                   |                  |
| 3.   | <i>Macaca mulatta</i> (Rhesus Monkey)                | Least concern            | II                | II               |
| 4.   | <i>Semnopithecus ajax</i> (Hanuman Langur)           | Endangered               | II                | I                |
| <b>Order: Carnivora Family: Canidae</b>        |  |                          |                   |                  |
| 5.   | <i>Vulpes vulpes</i> (Himalayan Fox)                 | Least concern            | II                | III              |
| 6.   | <i>Canis aureus</i> (Jackal)                         | Least concern            | II                |                  |
| <b>Family: Mustelidae</b>                      |  |                          |                   |                  |
| 7.   | <i>Martes flavigula</i> (Yellow Throated Marten)     | Least concern            | II                | III              |
| 8.   | <i>Mustela sibirica</i> (Himalayan Weasel)           | Least concern            | II                | III              |
| <b>Family: Ursidae</b>                         |  |                          |                   |                  |
| 9.   | <i>Ursus thibetanus</i> (Black Bear)                 | Vulnerable               | II                | I                |
| <b>Family: Felidae</b>                         |  |                          |                   |                  |
| 10.  | <i>Panthera pardus</i> (Leopard)                     | Near Threatened          | -                 | I                |
| <b>Family: Herpestidae</b>                     |  |                          |                   |                  |
| 11.  | <i>Herpestes</i> sp. (Mongoose)                      | Least concern            | II                | III              |
| <b>Family: Viverridae</b>                      |  |                          |                   |                  |
| 12.  | <i>Paradoxurus hermaphrodites</i> (Asian palm civet) | Least concern            | II                | III              |
| <b>Order: Artiodactyla Family: Cervidae</b>    |  |                          |                   |                  |
| 13.  | <i>Muntiacus muntjac</i> (Barking deer)              | Least concern            | III               | -                |
| 14.  | <i>Rusa unicolor</i> (Sambar)                        | Vulnerable               | III               | -                |
| <b>Family: Bovidae</b>                         |  |                          |                   |                  |
| 15.  | <i>Naemorhedus goral</i> (Himalayan Goral)           | Near Threatened          | III               |                  |
| 16.  | <i>Hemitragus jemlahicus</i> (Himalayan Ibex)        | Near Threatened          | I                 | -                |
| <b>Family: Suidae</b>                          |  |                          |                   |                  |
| 17.  | <i>Sus scrofa</i> (Wild Boar)                        | Least concern            | III               |                  |
| <b>Order: Rodentia Family: Muridae</b>         |  |                          |                   |                  |
| 18.  | <i>Rattus rattus</i> (House Rat)                     | Least concern            | V                 | -                |
| 19.  | <i>Mus musculus</i> (House Mouse)                    | Least concern            | V                 | -                |
| <b>Family: Sciuridae</b>                       |  |                          |                   |                  |
| 20.  | <i>Funambulus palmarum</i> (Squirrel)                | Least concern            | IV                | -                |
| <b>Family: Hystricidae</b>                     |  |                          |                   |                  |
| 21.  | <i>Hystrix indica</i> (Porcupine)                    | Least concern            | II                | -                |
| <b>Order: Lagomorpha Family: Leporidae</b>     |  |                          |                   |                  |
| 22.  | <i>Lepus timidus</i> (Hare)                          | Least concern            | IV                | -                |
| <b>Family: Ochotonidae</b>                     |  |                          |                   |                  |
| 23.  | <i>Ochotona roylei</i> (Himalayan Mouse Hare)        | Least concern            | IV                | -                |

IUCN: International Union for Conservation of Nature and Natural Resources; IW(P)A: Indian Wildlife (Protection) Act, 1972. CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora.



**Figure 2: Few mammalian species reported from Dharamshala.**

areas. Negi and Banyal<sup>[10]</sup> reported 23 mammalian species comprising 20 genera, 5 orders and 11 families from Rakchham-Chhitkul wildlife sanctuary located in the district Kinnaur, of Himachal Pradesh. The present study elucidated the presence of 23 species belonging to 23 genera, 17 families and 7 orders. Order Carnivora dominates over other orders in the study area i.e. having maximum numbers of species which are 8 in number. Order Carnivora is most well represented in the state of Himachal Pradesh species-wise.<sup>[13]</sup> Artiodactyla has five species, followed by Rodentia (4 species), Primates and Lagomorpha having 2 species each, whereas Insectivora and Chiroptera have 1 species each. Among these 23 mammals the most common mammals which are mostly seen in the study area are House Shrew, Indian Flying Fox, Rhesus Monkey, Mongoose, House Rat, House mouse and Squirrel. Himalayan Fox is also seen in local fields during the winter season. Yellow-throated Marten, Wild Boar, Black Bear, Leopard, Barking Deer, Sambar, Himalayan Goral, Himalayan Tahr, Himalayan Weasel and were mainly limited to the forest area. Black Bear dwells in rocky area and caves and hollow parts of

trees. Black Bears are omnivorous in dietary nature and their diet include more than 90% of plant materials and grasses.<sup>[14]</sup> The Bears feed on plantation and they destroy trees by stripping the outer bark and eating cambium portion in cultivated land.<sup>[15-17]</sup> Asian Palm Civet is also reported from the local Dharamshala area. The crops of local dwellers are invaded by Porcupine mostly during night time. Hare is found both in the forest as well as in local areas whereas Himalayan Mouse Hare is mostly found in the higher reaches of the study area.

## CONCLUSION

In the current study, the area in and around Dharamshala city was mapped, observed and investigated for prevalent mammalian fauna and different aspects like distribution, relative abundance and seasonal variations among mammalian fauna was also studied. The mammalian faunal diversity showed the presence of 23 species belonging to 23 genera spread among 17 families and 7 orders. Order Carnivora dominated over other orders in study area i.e. having maximum numbers of species which were 8 in number followed by Artiodactyla, 5 species and Rodentia, 4 species. Further, Primates and Lagomorpha both had 2 species. Finally, Insectivora and Chiroptera were having 1 species each. Interpretation and analysis of data clearly revealed that families Bovidae, Cercopithecidae, Canidae, Mustelidae, Cervidae and Muridae have 2 species each. It was found that maximum no. of mammalian species i.e. 17 species in Dharamshala and its suburbs are placed under Least Concern by International Union for Conservation of Nature (IUCN, 2013) whereas 1 species i.e. *Semnopithecus ajax* has been categorized as endangered, 2 species *Ursus thibetanus* and *Rusa unicolor* are vulnerable and 3 species *Panthera pardus*, *Naemorbedus goral* and *Hemitragus jemlahicus* have been declared threatened by IUCN. These findings will definitely augment the researchers and government institutions to frame various strategies and policies for conservation of mammalian faunal biodiversity of Dharamshala and its suburbs.

## CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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