



Wild medium and large size mammalian diversity in Hattian Bala, Azad Jammu and Kashmir, Pakistan

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SUMMARY

More than 4763 species of mammals were documented in worldwide; in Pakistan, 195 species of mammals were noted; out of total, 71 species of mammals were examined in Azad Jammu and Kashmir. This study was organized at Hattian Bala. Linear count survey model was applied to identify the mammalian diversity. Data were collected through direct method alongwith indirect method. Diversity was calculated through Shannon-Wiener index. A total of 11 species were noted from Hattian Bala and Shannon-Wiener diversity Index ($H' = 0.9759$) was documented from Hattian Bala. During this survey noted that Asiatic Jackal (*Canis aureus*) was documented as the most abundant medium and large size mammalian species in study area. It is concluded that this area has rich diversity of medium and large size mammals.

Keywords: Asiatic Jackal, Kashmir, Pakistan, Mammals, Diversity

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INTRODUCTION

Total 4763 species of mammals are documented in worldwide (IUCN, 2002); in Pakistan, 195 species of mammals are noted (Roberts, 1997b; Roberts, 2005a, b); out of total, 71 species of mammals are examined in Azad Jammu and Kashmir (Roberts, 1997b; Roberts, 2005a, b; Altaf, 2017). Biodiversity is important socially (Cilliers, 2010), scientifically (Heyer *et al.*, 2014), ethnomedicinally (Umair *et al.*, 2017; Altaf *et al.*, 2018b; Farooq *et al.*, 2019; Haidar and Bashir, 2021; Ijaz and Faiz, 2021; Ijaz and Iftikhar, 2021; Saleem *et al.*, 2021), educationally (Caro *et al.*, 2003) economically (McNeely, 1988), culturally (Maffi, 2005; Altaf *et al.*, 2017; Rasheed *et al.*, 2020; Altaf *et al.*, 2021), and aesthetically (Lindemann-Matthies *et al.*, 2010). It is also significant for biological control (Saba *et al.*, 2020) and bioindicator (Sidra *et al.*, 2019).

The basic knowledge pertaining to diversity for many species in the Himalayan range is limited due to low accessibility, rocky topography, and extreme weather conditions, etc. (Schaller, 1977) leaving an emptiness in the mammalian ecology understanding. We do not even know the status of many extant mammalian species and lag behind in reporting and searching undocumented species Azad

Jammu and Kashmir. Keeping these points in focus this research was designed to explore the mammalian diversity of a Hattian Bala, Azad Jammu and Kashmir.

MATERIALS AND METHODS

The data were collected from May 2016 through April 2017 in selected sites of Hattian Bala.

STUDY AREA

The District Hattian Bala is present on the east and north by the Baramulla District and Kupwara District of Indian-occupied Jammu and Kashmir, on the west by the District Muzaffarabad and on the south by the District Bagh. The Hattian Bala District has a population of 230,529 (The-Nation, 2017).

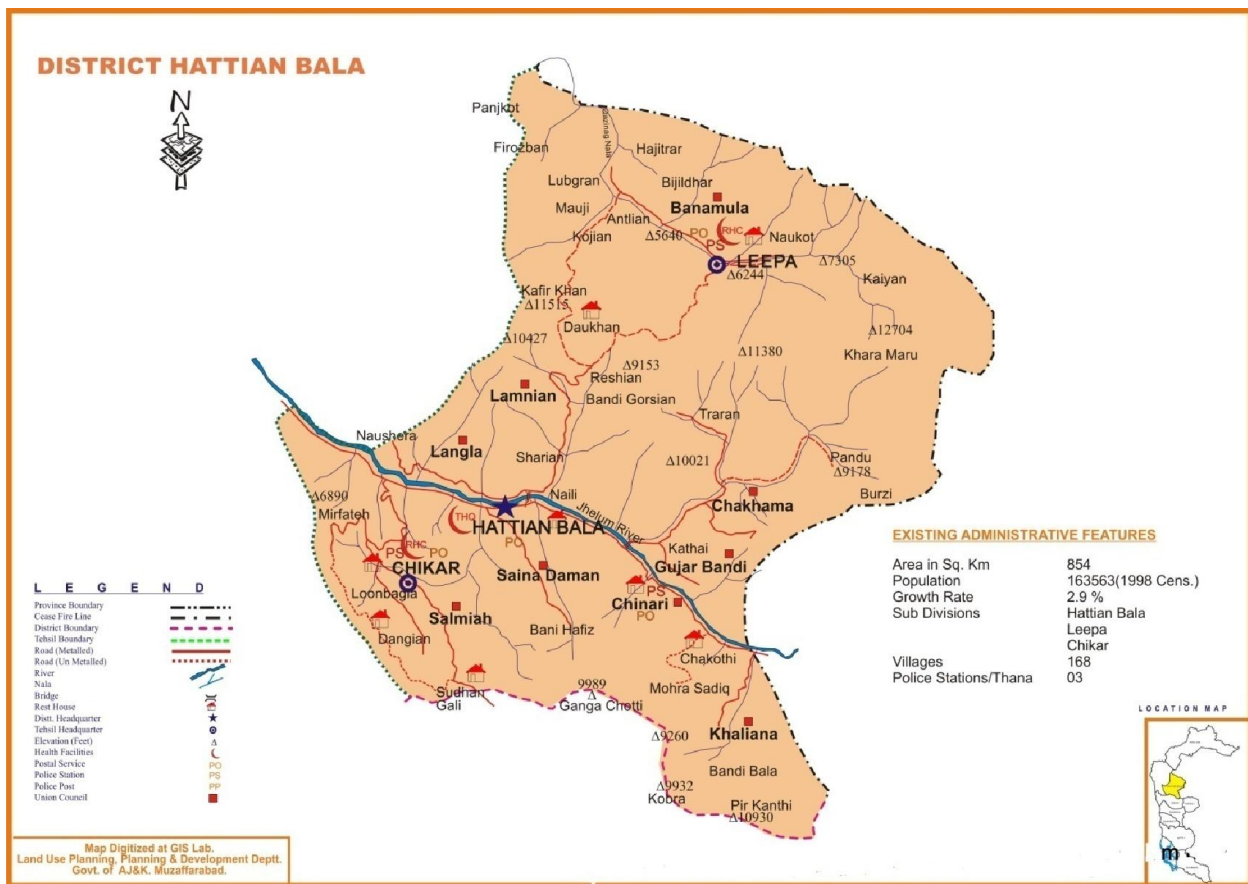


Figure 1: The map of Hattian Bala.

METHODOLOGY

The “linear count survey model” was utilized, while mammalian diversity was studied through “direct count” and “indirect count” methods. The direct count was as physical presence as well as voices while indirect count was i.e. presence of nests, hair mounting, fecal pellets, pug marks, foot-prints, and discussion with local people) (Haider and Altaf, 2018; Abbasi, 2021). Binoculars were utilized to recognize the fauna (Roberts, 2005a, b; Mirza and Wasiaq, 2007).

STATISTICAL ANALYSIS

The “Shannon-wiener diversity index” abbreviated H' as was calculated to know the diversity of mammalian species of the Hattian Bala through the formula (Shannon and Weaver, 1949).

$$“H' = -[\sum P_i \text{Log} P_i]”$$

Where, “ P_i ” is “Proportion of the species” and “ i ” is “relative to the whole number of species”, “ $\text{Log} P_i$ ” is “natural logarithm of this proportion”, “ S ” is “total no. of species” and “ N ” is “total no. of individual”.

RESULTS AND DISCUSSION

A total of 11 species were noted from the study area. “Shannon-Wiener diversity Index” was noted as 0.9759, (Table 1).

Asiatic Jackal (*Canis aureus*) was known as the most abundant species (relative abundance, 0.174) from Hattian Bala during this study, it was also noted from the whole Pakistan (Roberts, 1997a; Ghalib *et al.*, 2007; Rais *et al.*, 2011; Altaf *et al.*, 2014; Khan *et al.*, 2015; Iqbal *et al.*, 2018; Younus *et al.*, 2018). Himalayan black bear (*Ursus thibetanus*) was noted in Hattian Bala (relative abundance, 0.043) during this study, researchers document from KPK, GB, AJK (Khan, 2006).

During present study noted that *Sus scrofa* was seen from Hattian Bala and relative abundance was as 0.130 (Table 1). Scientists documented that Indian wild boar (*Sus scrofa*) from the whole Pakistan (Roberts, 1997a; Rais *et al.*, 2011; Altaf *et al.*, 2014; Chughtai *et al.*, 2018; Abbasi, 2021).

Hystrix indica was documented with relative abundance was as 0.122 in Hattian Bala (Table 1). Earlier Indian crested porcupine (*Hystrix indica*) was also documented from the whole Pakistan (Roberts, 1997a; Maan and Chaudhry, 2001; Rais *et al.*, 2011; Altaf *et al.*, 2014; Khan *et al.*, 2015; Iqbal *et al.*, 2018; Safeer *et al.*, 2018).

Present census showed that small Indian civet was seen from Hattian Bala with relative abundance was 0.070 (Table 1). Earlier small Indian civet (*Viverricula indica*) was noted from Sindh, Azad Jammu and Kashmir and Punjab (Khan, 2006; Altaf, 2017). Grey langur was reported from the Hattian Bala and relative abundance of Grey langur (*Semnopithecus entellus*) were as 0.087 (Table 1). Earlier it was reported from Punjab, Sindh and Azad Jammu and Kashmir (Khan, 2006; Jahangeer *et al.*, 2019; Rasheed *et al.*, 2020).

Common leopard (*Panthera pardus*) was noted with relative abundance of species was 0.130 in Hattian Bala (Table 1). Earlier noted from all provinces of Pakistan and AJK (Khan, 2006). Snow leopard (*Panthera uncia*) was noted with relative abundance of species was 0.035 in Hattian Bala. Earlier documented from KPK, GB and AJK (Khan, 2006; Fatima *et al.*, 2019).

Present census showed that Himalayan Palm was seen from Hattian Bala with relative abundance was 0.017 (Table 1). Earlier Himalayan palm civet (*Paguma larvata*) was seen from KPK, Punjab and AJK (Roberts, 1997a; Awan *et al.*, 2004; Rasheed *et al.*, 2020).

Red Fox (*Vulpes vulpes*) was seen in Hattian Bala (relative abundance, 0.113) during present study (Table 1). Earlier this was also noted from KPK and AJK (Qureshi *et al.*, 2011; Azad *et al.*, 2018; Iqbal *et al.*, 2018).

Herpestes javanicus was noted in Hattian Bala (relative abundance, 0.148) during present study (Table 1), and earlier small Indian Mongoose (*Herpestes javanicus*) was also documented from KPK, Punjab, Balochistan, Sindh and AJK (Roberts, 1997a; Ghalib *et al.*, 2007; Rais *et al.*, 2011; Khan *et al.*, 2015; Altaf *et al.*, 2018a; Iqbal *et al.*, 2018).

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Table 1: Diversity of mammals in Hattian Bala, Azad Jammu and Kashmir.

Sr.	Common name	Scientific name	R.A/Pi	LogPi	PiLogPi
1	Indian Crested Porcupine	<i>Hystrix indica</i>	0.122	-0.91457	-0.1113
2	Small Indian Civet	<i>Viverricula indica</i>	0.070	-1.15761	-0.0805
3	Grey Langur	<i>Semnopithecus entellus</i>	0.087	-1.0607	-0.0922
4	Asiatic Jackal	<i>Canus aureus</i>	0.174	-0.75967	-0.1321
5	Himalayan Black Bear	<i>Ursus thibetanus</i>	0.043	-1.36173	-0.0592
6	Common leopard	<i>Panthera pardus</i>	0.061	-1.2156	-0.0740
7	Indian Wild Boar	<i>Sus scrofa</i>	0.130	-0.88461	-0.1154
8	Himalayan Palm civet	<i>Paguma larvata</i>	0.017	-1.75967	-0.0306
9	Snow Leopard	<i>Panthera uncia</i>	0.035	-1.45864	-0.0507
10	Red Fox	<i>Vulpes vulpes</i>	0.113	-0.94675	-0.1070
11	Small Indian Mongoose	<i>Herpestes javanicus</i>	0.148	-0.83025	-0.1227
Total					-0.9759
Shannon-Wiener Diversity Index (H')					0.9759