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Unveiling the Heaven: First Sighting of Three Avian Species in Kibber Wildlife Santuary, Trans Himalayan Ecosystem, Himachal Pradesh, India

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Globally all mountains including the Himalaya are highly susceptible ecosystems due to the given climatic conditions and land-use changes. Field observations play crucial role in grasping the birds distribution species in biologically and evolutionary important regions particularly in Trans Himalayan ecosystem like the Kibber Wildlife Sanctuary with abundant avian species diversity among all vertebrates found in sanctuary. Present research paper deals with significant bird species sightings in this hard-to-access sanctuary. These bird sightings show how conducting biological surveys and continuous monitoring work help to enhance our understanding using various methods. The stratified random sampling technique was employed for avian fauna survey. Earlier, there were almost negligible efforts made on comprehensive studies of vertebrate diversity in the Kibber Wildlife Sanctuary which makes this study more significant as it will be the baseline

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information for the forest department and scientific research. The records of four documented birds species are valuable especially since these all are first sightings in the KWS and their IUCN status was also evaluated. Listing of bird's species will contribute to a better understanding of birds distribution and will be helpful for future research and conservation plans.

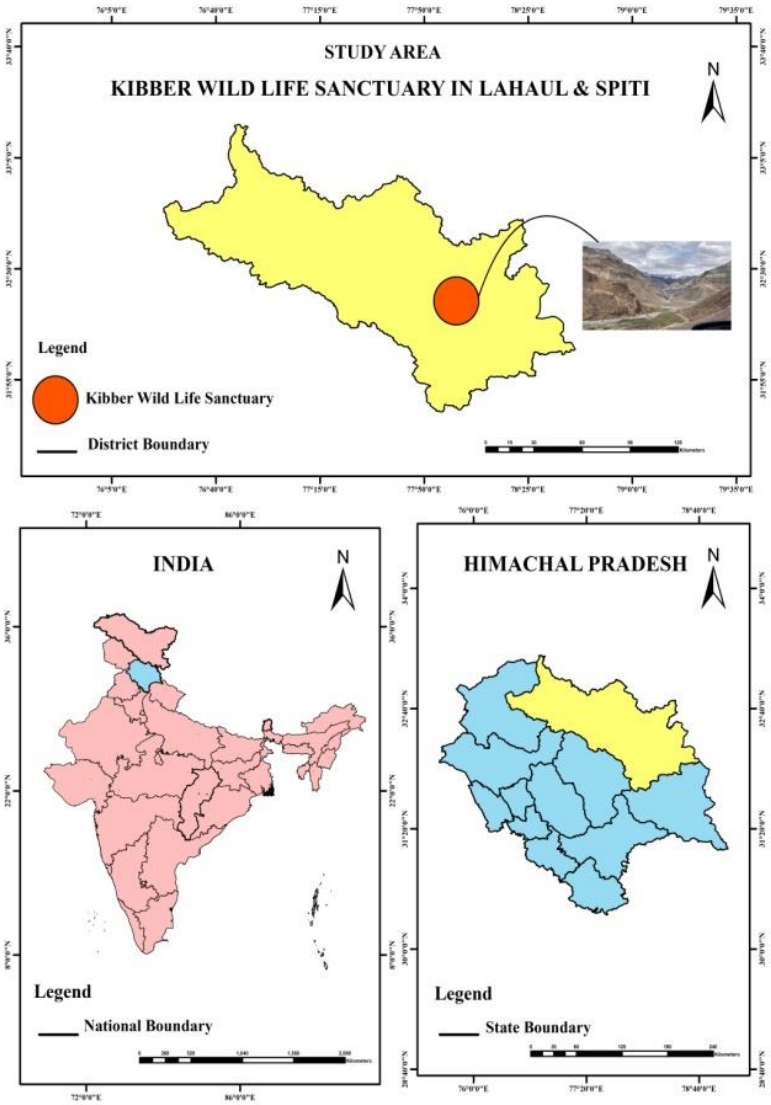
Keywords: Avifauna; Kibber wildlife sanctuary; IUCN; trans Himalaya.

1. INTRODUCTION

Mountain systems are alluring models for studying biodiversity due to their unique species richness [1]. The Indian Himalayan zone holds a unique position in the global mountain ecosystems. Himalaya is not just about the unique climatic conditions and being a source of life but is also a treasure trove of peculiar plants and animals [2]. The Himalaya within India traverses across a vast region and extends between latitude (21˚57'37˚5' N and 72˚40'92˚25'E) longitudes it is approximately 612021km^2. The Himalaya is categorized primarily into two mountain ranges i.e. the Cis-Himalaya and Trans-Himalaya. The Trans-Himalayan range lies to north of the main range (Great Himalayas) and include Zaskar, Ladakh and Karakoram range. The biota distribution helps in categorization of world into different bioregions [3,4]. Birds communities that are found at different altitudes like 1000 metres apart have distinct variance from each other. These differences are mostly because of changes in rainfall patterns [5]. The populations of birds are perceived as significant indicators of a nation's environmental well being and [6]also the abundance and diversity of avian fauna reflect the ecosystem health. Being spectacular and susceptible towards environmental alterations these are the most suitable indicators to assess the environmental conditions of an area[7]. Birds are known for their ecological versatility as they can survive in almost all types of habitats. Ecologists have made remarkable strides in understanding the species habitat, ecological niche modelling and macroecological analysis in Himalaya. But ornithological studies in Spiti valley have not been thoroughly studied yet. Earlier the researchers have mainly focused on a few specific types of invertebrates and vertebrates in this area. The exploration of Spiti valley to study the birds goes back to 1868 when the famous naturalist Stoliczcka [8] made few observations there. Then later in the year 1922, Huge whistler reported over 40 bird's species up to Kibber village including the species that were previously recorded by Stoliczka. Also avian faunal checklist of birds [9] compiled from different sources since the years revealing a total of 278 birds species in Lahaul and Spiti district with Muscicapidae family having the most species. As Spiti valley is geographically so remote and many areas are difficult to access combined with the extreme climatic conditions, there are few gaps in our knowledge about rare species and even some familiar species that are locally present or have less population densities are unidentified. It shows that there is still a whole lot more to uncover and understand about the natural history of Spiti valley. Practically no thorough research has been conducted on the birds species found in Kibber Wildlife Sanctuary. The baseline information regarding the avian fauna is actually very important because it helps us to monitor any changes or trends in the birds species over time [10]. The aim of this research was to carry out an initial investigation of the birds species with the purpose of creating avian inventories for forest department as well as for conducting further research in Kibber Wildlife Sanctuary.

1.1 Study Area

Present study was conducted in Kibber Wildlife Sanctuary (KWLS) located in Spiti valley of district Lahaul and Spiti in Himachal Pradesh. It lies between 32° 8′ 49.082" to 32° 45′39.903" N latitudes and 77° 47′ 59.726" to 78° 31′ 29.452" E longitudes and covering an area of about 1200 km^2 . It is bordered in the northern catchment of the Spiti river and is enclosed by Ladakh in the north and Tibet in the east [11]. The sanctuary has been divided into 3 beats named as Kibber, Langza and Lalung. The research work was done mainly in Kibber beat. As the moisture loaded south west monsoon winds are blocked by the Greater Himalayan range merged with its location in the temperate latitudes the region faces the scarcity of water and this rain deficient region is termed as "cold desert". Temperature in the cold desert generally varies from -45°C during winter to 40°C in summers and very less rainfall (below 60 mm). The burgeoning season is comparatively short in this area due to uncommon climatic conditions and summer is only period for the vegetation growth [12]. The kind of vegetation present in Kibber Wildlife Sanctuary comes under alpine



Map 1. Kibber Wildlife Sanctuary in Lahaul and Spiti distt of Himachal Pradesh

and high alpine zones. Kibber wildlife Sanctuary is completely devoid of trees and the vegetation is characterised by wild annual, perennial herbs, dwarf bushes and shrubs only [13].

2. MATERIALS AND METHODS

The present study was carried out in Kibber Wildlife Sanctuary during the year 2023. Due to harsh cold weather and tough terrain most of the study area was covered by trekking only. The stratified random sampling technique was employed for avian fauna survey. Many sites were covered including rocky barren land, herbs area and thorny bushy shrubs mats. Observations were made by digital Nikon Coolpix P1000 (125 × Optical Zoom) 3000 mm Super telephoto lens for keeping the birds record. Birds were identified with the assistance of field guides [14],[15] and avibase. After identification, nomenclature was assigned according to [16].

3. RESULTS AND DISCUSSION

Our surveys detected 4 species of birds in Kibber Wildlife sanctuary which are distributed under four families. All the evaluated species listed in this research paper are categorized as “least concern” according to IUCN status.

3.1 Black Red Start

Phoenicurus ochruros (Black redstart) is a widely famous bird present in various parts of Europe, Asia, and even north-west Africa. Some of them migrate during winter while others stay in milder areas. They are quite resourceful, nesting in crevices or holes in buildings [17]. They belong to the family Muscicapidae. Female black red start was spotted first perching on a rock. It had a grey color body having an orange-red colored tail and lower rump which was slightly grey in color than the common redstart. An adult male black redstart was approached, perching calmly on a horizontal branch and photographed. The male black redstart had mostly black and dark grey upperparts with a breast of dark black colour. Its lower rump and tail on the other hand were of vibrant orange-red and the two central tail feathers were of dark red-brown colour. The Black redstart had a super wide range of elevations. It can be found from near sea shore to all the way up to 5000 meters in the Tibetan plateau, which is one of the largest elevational distributions among passerine birds [18]. However, an earlier reference to its presence in Spiti region is available [19] but no previous mention of its sighting in Kibber Wildlife Sanctuary was found.

Fig. 1. *Phoenicurus ochruros* (Female Black Redstart)

3.2 Rock Bunting

Rock bunting belongs to bunting family Emberizidae. The passerine bird prefers to breed in open, dry and rocky mountainous areas. One individual of this bird species was observed in the bushy thorns with the lush green grass in background during the survey. This male rock bunting had beautiful chestnut upperparts, deep buff underparts and pale grey head with striking black striping. There is no descriptive mention of this species inside Kibber Wildlife Sanctuary in the past. It seems that the rock bunting is a polytypic species and resides in the western Himalayas from the central Nepal to Afghan border. During winter it visits the adjacent southern plains. It is quite fascinating how their range extends to different regions.

Fig. 2. *Phoenicurus ochruros* (Male Black Redstart)

Fig. 3. *Emberiza cia* (Rock Bunting)

3.3 Yellow Billed Chough

Two species of *Parryrrhocorax i.e. Parryrhocorax graculus and Parryrhocorax parryrhocorax* were also recorded inside Kibber Wildlife Sanctuary. Two individuals of each species were found sitting together on the ground. *Pyrrocorax graculus*(i.e. yellow billed chough) belongs to corvidae family and makes unique calls. It had a shiny black coat, yellow beak, red legs. The young ones of the alpine chough are not as vibrant as the adults. They have a less bright yellow beak and are more brownish in colour. It

appears that the alpine regions with rocky desert lands are the preferred habitat for yellow-billed or alpine choughs *Pyrrhocorax graculus* [20]. The grown-up alpine choughs of the main subspecies have sleek black feathers a small yellow beak, dark brown eyes and red legs [21].

Fig. 4. *Pyrrochorax graculus* (Yellow billed Chough)

Fig. 5. *Pyrrochorax pyrrochorax* (Red billed Chough)

3.4 Red Billed Chough

The bird was often sighted perching on rocks to rest, searching for food, or surveying their surroundings in Kibber Wildlife Sanctuary. This bird had a stunning velvet-black plumage with a green gloss on its body. It also had a curved longer red bill and red legs as well. The males and females look similar, but adults can be distinguished by measuring their tarsus length and bill width [22].The red-billed chough is generally found in Western Great Britain, the Isle of Man, southern Europe, the Mediterranean basin, the Alps and Central Asia, India, and China. This bird is a resident throughout its range and doesn't migrate [20]. The red-billed chough also known as the Cornish chough or simply chough belongs to the crow family i.e. corvidae and is one of just two species in the *Pyrrhocorax* genus.

4. CONCLUSION

To best of our knowledge, this is the only descriptive documented record of birds species in Kibber Wildlife Sanctuary from the region. We believe this intriguingly understudied realm deserves increased attention. Further avifauna studies on Kibber Wildlife Sanctuary will clarify the situation of other species from the sanctuary, but we consider that emphasis must be given to those zones that still have rare and threatened species. Taking into account the dearth of information on the avian fauna of this opulent landscape in terms of endemic species this document proves to be of great importance in organizing the baseline information. In the future, researchers can explore bird occupancy in different habitats and their movement patterns in different seasons, conduct surveys in unexplored regions of sanctuary and systematically study the avifauna along the Kibber Wildlife Sanctuary. This research in KWS holds significant scientific and conservation promise, and we anticipate that studying birdlife in detail will resurrect the realization of that potential. It is crucial to prioritize areas that harbor rare and endangered species for further investigation. Studying the birds in this research highlights the importance of conducting biological surveys in challenging to reach areas and monitoring birds populations. We also have records that show expansions in their range and records that we find are quite significant for biogeography and conservation.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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