



## PRELIMINARY SURVEY OF AVIFAUNAL DIVERSITY IN MADHAV NATIONAL PARK SHIVPURI, MADHYA PRADESH, INDIA

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### ABSTRACT

The present study covers the avifaunal diversity documented in the year 2018 to 2019 from the Madhav National Park, Shivpuri, Madhya Pradesh, India. The study was conducted selecting three sites using Point Count and Line transects methods. A total of 65 bird species, belonging to 11 orders and 30 families, were recorded from the three different sites of the study area. The highest numbers of birds (46 species) were recorded from order Pesseriformes. During the Study period the summer migratory birds like Asian Green bee-eater (*Meropus orientalis*), Black Redstart (*Saxicoloides fulicatus*) were found in selected study sites of Madhav National Park. The aim of the present study was to prepare the checklist of the avifaunal diversity. The present study focuses on the needs for on setting priorities for habitat protection.

**KEYWORDS** - Madhav National Park, Madhya Pradesh, Shivpuri, Avifaunal, Diversity.

### INTRODUCTION

Birds are the most beautiful and sensitive groups of vertebrates. The birds are one of the unique omnipresent fauna which occupies or uses both terrestrial and wetland habitats for roosting, foraging and breeding activities (Kumar, 2021). The species diversity and their existence are greatly influenced by environmental resources and biological community (Pragasana and Madhesh, 2018). Assessment of bird community is important tool in biodiversity conservation and identification of conservations. Having knowledge on diversity and composition of bird communities is also crucial to determine the health status of the local ecosystem or regional landscape (Shetty *et al.*, 2015). The bird species are widely distributed among various habitats in Madhya Pradesh region. Madhya Pradesh is situated in central India, having a subtropical climate. It is the home of several national parks, Madhav national Park is one of them. Many studies have been conducted on aquatic avian diversity in aquatic areas of Madhav National park; there is lack of such studies from the terrestrial sites of Madhav National park. Present need of conservation for forest areas and forest patches is to reduce threats of its natural faunal diversity (Pattimahu *et al.*, 2017). The main objective of the present research works about a bird diversity, their abundance and residential status and suggest necessary actions for protection and conservation of bird population at the Madhav National Park, Shivpuri, Madhya Pradesh.

### MATERIALS AND METHODS

#### Study Area

The present study was carried out at Madhav National Park, Shivpuri, Madhya Pradesh, India. Madhav National Park, established on 10 June 1959, covers an area of about 354km<sup>2</sup>. The Madhav National Park is a well protected ecological site with rich flora and fauna. The dominant tree species in the area are Kardhai (*Anogeissus pendula*),

Khair (*Acacia catechu*), Palash (*Butea monosperma*) and Salai (*Boswellia serrata*). The study area was divided into three different sites; Site -1 (George Castle), Site -2 (Ambakunj) and Site -3 (Baradari). George Castle (Site-1) is situated at the highest elevation of Madhav National Park 484.0 m (1,587.9ft). The George Castle, a historical building, was built by Madho Rao Scindia of the Gwalior royal family. It is important to note that there were no water resources available for faunal species. Ambakunj (site-2) is situated approximately 2 km from George Castle. A well is situated on the area and due to the presence of this well, the area is called Ambakunj. The Ambakunj is also a terrestrial site with no human disturbance. Baradari is a marble structure designed in Italian style situated on a hillock facing near the Sakhya Sagar lake. It provides pollution-free habitation along with negligible human disturbance. Thousands of people come to visit the Park every year.

#### Methods

During the field work three study sites were selected for detailed observation. Data were collected by Point count method and Line-transects method. The birds were observed using binocular and photographs were taken wherever possible. The identification of the birds was done by using standard field guide (Grimmett *et al.* 2015). Survey was conducted from 6:00 A.M. to 12:00 PM in the morning and 3:00 PM to 6:00 P.M. in the evening. The abundance of bird species was assigned on the basis of their sightings as common (C), frequently (F), Occasional (O) and rare (R) for the species.

#### Result

Total 65 bird species, belonging to 11 orders and 30 families were observed from selected study sites. Checklist of bird species have been enlisted in Table 1. Residential status of bird species and abundance status of birds are presented in Table 2 and 3 respectively.

Preliminary survey of avifaunal diversity in Madhav National Park

Residential status of bird species, abundance status of birds and order-wise distribution of birds have been shown in figure 1, 2 and 3 respectively. Pictures of the some common birds have also been given.

**TABLE 1:** List of observed avifaunal species and their status at Gorge Castle (Site-1), Ambakunj (Site-2) and Baradari (Site-3) in Madhav National Park Shivpuri, M.P., India during October 2018 November 2019.

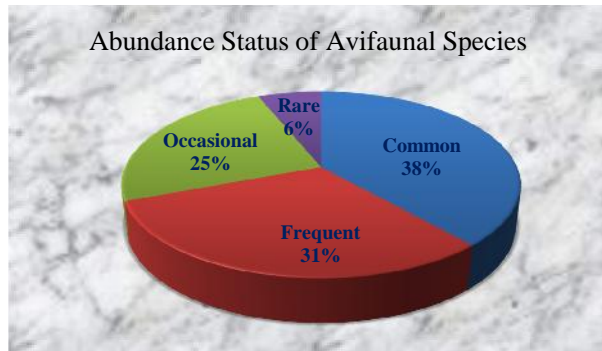
S.N.	ORDER	FAMILY	SITE-1	SITE-2	SITE-3	TOTAL
1	CHARADRIIFORMES	CHARADRIIDAE	0	1	0	1
2	COLUMBIFORMES	COLUMBIDAE	6	5	5	6
3	PSITTACIFORMES	PSITTACIDAE	2	2	2	2
4	CUCULIFORMES	CUCULIDAE	0	0	1	1
5	CAPRIMULGIFORMES	APODIDAE	2	1	0	2
6	CORACIIFORMES	ALCEDINIDAE	0	3	2	3
7		MEROPIDAE	1	1	1	1
8		CORACIIDAE	0	0	1	1
9	BUCEROTIFORMES	BUCEROTIDAE	0	1	1	1
10	PICIFORMES	MEGALAIMIDAE	0	1	1	2
11		PICIDAE	0	0	2	2
12	PASSERIFORMES	LANIIDAE	1	1	2	2
13		CAMPEPHAGIDAE	0	1	0	1
14		DICRURIDAE	1	2	1	2
15		STURNIDAE	2	2	2	2
16		CORVIDAE	3	1	2	3
17		MUSCICAPIDAE	0	3	3	5
18		MONARCHIDAE	1	1	0	1
19		ESTRILDIDAE	0	1	0	1
20		PYCNONOTIDAE	1	1	1	1
21		PLOCEIDAE	0	1	1	1
22		NECTARINIIDAE	0	1	0	1
23		PARIDAE	1	0	0	1
24		CISTICOLIDAE	2	4	4	4
25		LEIOTHRICHIDAE	3	3	3	3
26		PESSERIDAE	2	2	2	2
27		ZOSTEROPIDAE	0	1	1	1
28		DICACIDAE	0	1	0	1
29	ACCIPITRIFORMES	ACCIPITRIDAE	2	4	6	8
30	GALLIFORMES	PHASINIDAE	0	3	2	3
	TOTAL		25	47	48	65

**TABLE-2** Abundance status of reported bird species of Madhav National Park

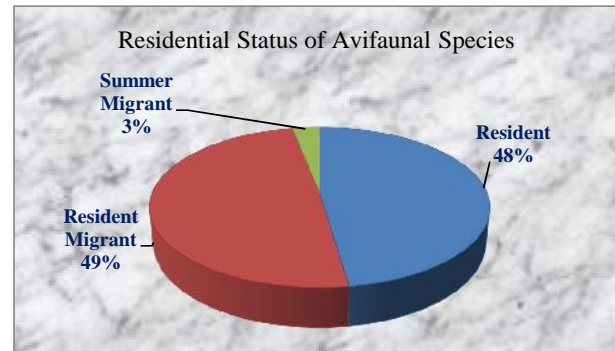
S.N.	Abundance Status	Number of species	Percentage
1	Common	25	38%
2	Frequent	20	31%
3	Occasional	16	25%
4	Rare	4	6%

**TABLE-3** Residential status of reported bird species of Madhav National Park

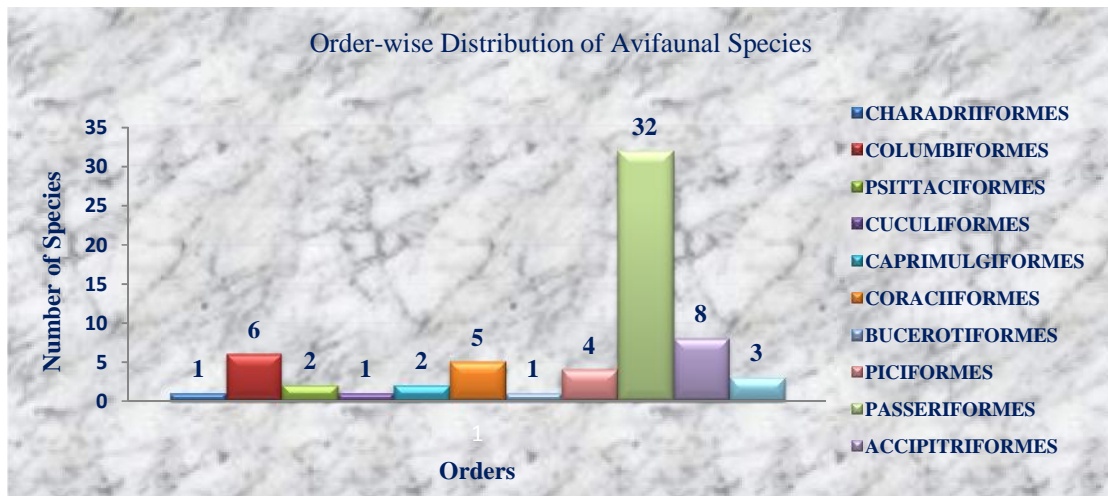
S.N.	Residential Status	Number of species	Percentage
1	Resident	31	48%
2	Resident Migrant	32	49%
3	Summer Migrant	2	3%



**Fig.1** Abundance status of avifaunal species of the Madhav National Park



**Fig. 2** Residential status of avifaunal species of the Madhav National Park



**Fig. 3** Order-wise distribution of avifaunal species of the Madhav National Park

Some important birds of the Madhav National Park, Shivpuri, Madhya Pradesh, India



Red-wattled Lapwing (*Vanellus indicus*)



Common Kingfisher (*Alcedo atthis*)



Rufous Treepie (*Dendro cittavagabunda*)



Plum-headed Parakeet (*Psittaculacyano cephalo*)



Black-rumped Flameback (*Dinopium benghalense*)



Red-headed Vulture (*Sarcogyps calvus*)

## DISCUSSION

Present study reveals that the order Passeriformes was the most dominant one represented by 17 families including 32 species, 4 migratory and 11 residents. It was followed by Accipitriformes (8 species), Columbiformes (6 species), Coraciiformes (5 species), Piciformes (4 species), Galliformes (3 species) and Psittaciformes and Caprimulgiformes (2 species each). Orders Charadriiformes, Cuculiformes and Bucerotiformes were represented by one species each. Earlier studies of Chopra *et al.*, (2017), in and around Bhindawas bird sanctuary, Haryana have also reported Passeriformes as the most dominant order representing highest number of species. According to Beresford *et al.* (2005) Passerine birds represent high diversity because of their ability to use various kinds of habitats and to have large variety of food *viz.* seeds, fruits, nectar, leaf. Abundance status showed that out of the total 65 species avian species, 38% (25 species) were common, 31% (20 species) were frequent, 25% (16 species) were occasional and 6% (4 species) were rare. Similar findings were also observed by Virani (2021) who recorded 74% species as common, 17% as uncommon, 5% as rare and 14% as very rare species in Central India. Tomar *et al.*, (2017) recorded 50 species as common, 24 as fairly common, 22 as uncommon and 8 bird species as rare, out of the total 104 bird species in Bareilly, Uttar Pradesh. Further analysis of residential status in the present study also indicates that of the 65 bird species, 31 species were residents and 32 were resident migrants. Only 2 species were summer migratory (Table-2). The summer migratory species were Asian Green bee-eater (*Meropus orientalis*), Black Redstart (*Saxicoloides fulicatus*). Kumar (2015) reported that 57 species were resident, 28 were resident migratory and 10 were migratory species in Gujarat region. Shakya and Lodhi (2021) recorded 92% (49 species) as residential and only 4 species (8%) as residential migrant in Ramkrishna Ashram Gwalior, Madhya Pradesh, India.

The result of the study reveals that the study sites of Madhav National Park are rich in terms of avifaunal diversity and abundance. The species diversity and abundance were found highest at Site-3 (Baradari) which is close to the lake. Xie and Ouyang (2021) also suggested a preference for habitats nearby water bodies among forest birds residing highly urbanized areas. The species diversity was found lowest at Site-1 (Gorge Castle) in comparison to Site-2 (Ambakunj) and Site-3 (Baradari). This was probably due to the higher frequency of

developmental work activities continuously being carried out in this area during the study period. The bird community structure is affected by the changes in vegetation structure either due to natural, destruction of habitat and human induced (Maurer 1981, Rahayuningsih *et al.*, 2007, Singh *et al.*, 2018)

## CONCLUSION

The present study reveals that the bird species varied at different the study sites. The minimum number of birds was recorded and identified at the Gorge castle site, while at the Baradari site the presence of bird species were maximum. These results indicate that disturbances due to human activities and construction work have adverse impacts on the diversity and distribution of avifaunal species in the Park area. Most of the bird species also depend on water either directly or indirectly. It is essential that some small ponds of water should be constructed at the terrestrial sites, so that availability of water is insured throughout the year. For long term management of this proper action plan and regulation strategies are needed. Implementation of appropriate steps is required to make it a more suitable habitat for the several resident and migratory bird species. This study highlights importance of the terrestrial sites of Madhav National Park for maintenance of the ecological balance.

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