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Avian Richness in Dongargarh-Dhaara Forest Area: A Baseline Study for Future Conservation, District Rajnandgaon, Chhattisgarh, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The Dongargarh-Dhaara Forest, situated in north-west region of Rajnandgaon District of Chhattisgarh, India, represents a crucial habitat for avian biodiversity. This study presents a comprehensive checklist of the avian fauna within this reserve forest, aiming to document the diversity and provide a baseline for future conservation efforts. Systematic surveys were conducted over a period of one year, from January 2022 to December 2022, covering various seasons to account for migratory, local migratory and resident bird species. Standard ornithological methods,

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including point counts and transect walks, were employed to ensure robust data collection. A total of 289 bird species were recorded, belonging to 56 families, 289 genera and 19 orders. Among these, several species of conservation concern were identified, including the Grey-headed Fish Eagle (*Haliaeetus ichthyaetus*) laggar falcon (*Falco jugger*) Ferruginous duck (*Aythya nyroca*), painted stork (*Mycteria leucocephala*), black-headed ibis or Oriental white ibis (*Threskiornis melanocephalus*), are listed on the IUCN Red List. The avian community structure showed a dominance of Passeriformies species, reflecting the diverse habitats ranging from dense forest canopies to open grasslands and water bodies within the reserve forest. The findings highlight the Dongargarh-Dhaara Forest as a significant avian biodiversity hotspot in the region. The presence of a variety of species, including endemic and migratory birds, underscores the ecological importance of this forest and the need for its conservation. -This checklist serves as a vital resource for ornithologists, conservationists, and policy-makers, providing a foundation for monitoring avian population trends and implementing effective management strategies to preserve this rich avian heritage.

Keywords: Avian; habitat; biodiversity; forest; ecological; conservation; monitoring; foundation.

1. INTRODUCTION

The Dongargarh-Dhaara Forest, nestled in the picturesque Rajnandgaon District of Chhattisgarh, India, represents a vital ecological enclave within the Central Indian Highlands [1]. Spanning a diverse array of habitats, this reserve forest is characterized by its rich mosaic of evergreen and deciduous forests, rolling hills, and intricate river systems [2]. This biodiversity hotspot not only plays a crucial role in the preservation of flora and fauna but also supports a significant population of avian species, making it a focal point for ornithological studies and conservation efforts [3]. Understanding the native avian fauna of the Dongargarh-Dhaara Forest is essential for several reasons [4]. First, it contributes to our broader knowledge of avian biodiversity in Central India, a region noted for its unique and varied ecosystems [5]. Second, it aids in the assessment of the health and stability of these ecosystems, as birds often serve as indicators of environmental quality and ecological balance [6]. Third, detailed documentation of bird species is critical for informed conservation strategies, particularly in areas facing threats from habitat loss, climate change, and human encroachment [7]. This checklist aims to provide a comprehensive overview of the avian species native to the Dongargarh-Dhaara Forest [8]. It highlights the diversity and distribution of birds within this region, offering insights into their ecological roles and seasonal patterns [9]. By compiling this information, we hope to contribute to going conservation efforts and foster a deeper appreciation for the avian life that inhabits this unique and vibrant reserve forest [10]. The ecological significance of the Dongargarh-Dhaara Forest extends beyond its role as a habitat [11]. The forest acts as a vital watershed, contributing to the regional water cycle and supporting numerous aquatic and terrestrial ecosystems [12]. Its varied vegetation, from moist deciduous forests to scrublands, provides critical resources and shelter for numerous species [13]. The forest's complex landscape also moderates local climate conditions, influencing temperature and humidity levels that are beneficial for diverse biological communities [14]. Birds are among the most visible and diverse components of the Dongargarh-Dhaara Forest's fauna. The region's avian diversity reflects the varied habitats within the forest, including open grasslands, dense canopies, and riverine environments [15]. Birds in this area range from resident species that inhabit the forest year-round to migratory species that visit during specific seasons. Their presence is indicative of the forest's ecological health and richness [16]. A comprehensive checklist of the native avian fauna in the Dongargarh-Dhaara Forest serves several important purposes [17]. First, it provides baseline data essential for monitoring changes in bird populations and distributions over time [18]. This information is crucial for assessing the impacts of environmental changes, conservation initiatives, and habitat management practices [19]. Second, the checklist helps in identifying key species that may be of conservation concern, including endemic or threatened species that require targeted protection efforts [20]. Additionally, understanding the avian species present in the reserve contributes to broader ecological studies, such as those focusing on species interactions, food webs, and habitat preferences [21]. By documenting the variety and abundance of bird species, researchers can better understand the

ecological dynamics of the forest [From, Fig. 1] and the role that birds play in maintaining its health and functionality [22].

2. STUDY SITE

The study was conducted in the Forest and wetland areas of Dongargarh Dhaara Forest range GPS Location 21.36109950865334, 80.60067044579499 approximate 109.75 km^2[From, Fig. 1], located in the state of Chhattisgarh [From, Fig. 1], India. The study area encompassed multiple reserve forest, including manmade reservoir, ponds, marshes, river trench and associated riparian zones, known to support local avian and migratory bird populations [From, Fig. 1] [21].

3. METHODOLOGY AND DATA COLLECTION

The checklist is prepared based primarily on the field survey conducted during January 2022 to December 2023 across Dongargarh-Dhaara Forest area district Rajnandgaon by two wheeler and tracking i.e., Water reservoir, Wetland and along the road side count [22]. We collected observations by *Look and See* methodat selected sites, following Point Count method by noting direct sightings of the birds, walking along the shoreline to collect bird observations.In the heronry, total counts were carried out by direct and point counting methods for the birds[23]. A total of 60 visits (05 visits per month) were spent in the field observing status, nesting, juveniles and relative diversity of birds. Birds were observed from morning to evening randomly and identified using Binocular Nikon8245 ACULON A211 8X42, Canon R100 Mirrorless Camera and field guides were deployed for observing and obtaining the images of species encountered. The status of birds was determined and categorized into three groups such as; Residential, Local Migratory, Migratory and Wetland on the basis of their Nesting, Breeding, foraging, abundance and seasonality of variation and occurrence [24]. At each sighting birds were counted using a binocular and identified. In case of doubtful identification, photographs were taken and the species is identified later by consulting experts. Identification of birds was also done using field guides [25]. The checklist was prepared using standardized common and scientific names of the birds following. Difficult species were identified using Merlin and e-bird [26]. The bird species were recorded by applying 'Transect line method'. An observer moves along a transect line in a line - transect survey method and notes the location of all detected birds on the line [27].

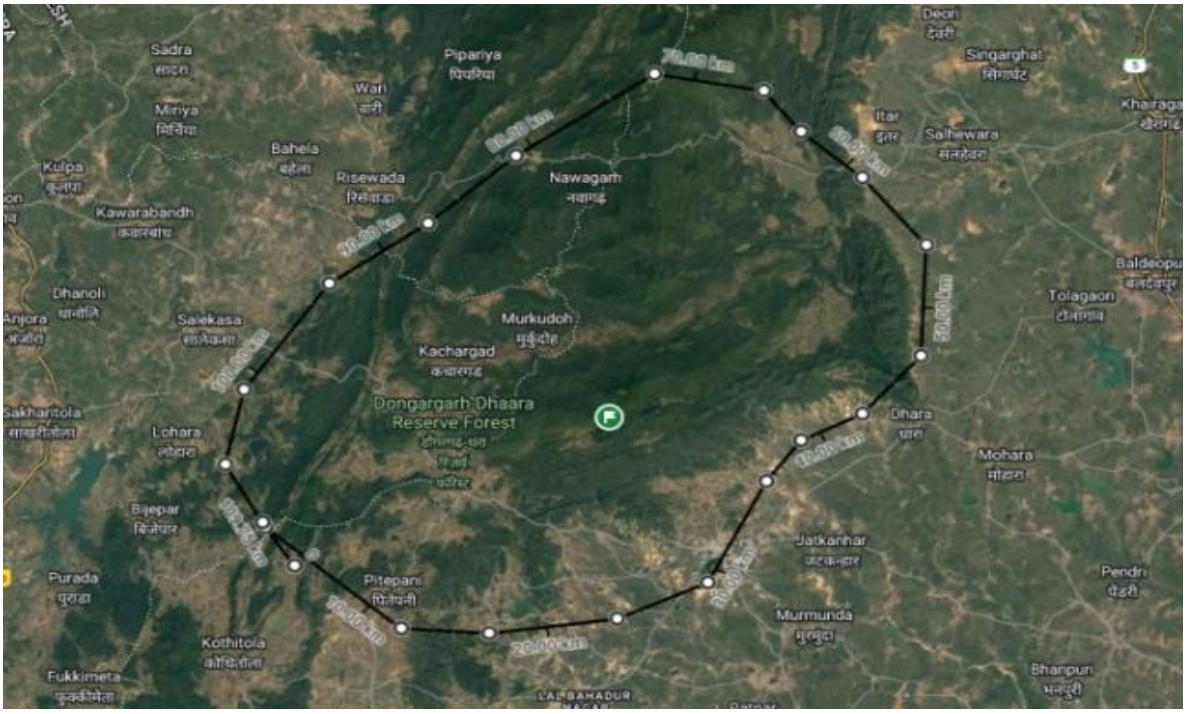

Fig. 1. Map showing the study area Dongargarh-Dhaara reserve forest

Table 1. List of Avian Fauna in study area

SN	Order	Bird Name	Scientific Name	Dongargarh	Dhara forest	Bortalav	Paniya - job
1	Accipitriformes	Besra	*Accipiter virgatus*	+	-	-	-
2	Accipitriformes	Black Kite	*Milvus migrans*	+	+	+	-
3	Accipitriformes	Black-winged Kite	*Elanus caeruleus*	+	+	+	-
4	Accipitriformes	Bonelli's Eagle	*Aquila fasciata*	+	+	+	-
5	Accipitriformes	Booted Eagle	*Hieraaetus pennatus*	-	+	-	-
6	Accipitriformes	Changeable Hawk-Eagle	*Nisaetus cirrhatus*	+	-	-	-
7	Accipitriformes	Crested Serpent-Eagle	*Spilornis cheela*	+	+	+	-
8	Accipitriformes	Egyptian Vulture	*Neophron percnopterus*	+	+	-	-
9	Accipitriformes	Eurasian Sparrowhawk	*Accipiter nisus*	+	+	-	-
10	Accipitriformes	Gray-headed Fish-Eagle	*Ichthyophaga ichthyaetus*	+	+	+	-
11	Accipitriformes	Indian Spotted Eagle	*Clanga hastata*	-	-	+	-
12	Accipitriformes	Long-legged Buzzard	*Buteo rufinus*	-	-	+	-
13	Accipitriformes	Oriental Honey-buzzard	*Pernis ptilorhynchus*	+	+	+	-
14	Accipitriformes	Osprey	*Pandion haliaetus*	+	+	-	-
15	Accipitriformes	Pallid Harrier	*Circus macrourus*	-	+	-	-
16	Accipitriformes	Red-headed Vulture	*Sarcogyps calvus*	-	-	+	-
17	Accipitriformes	Rufous-bellied Eagle	*Lophotriorchis kienerii*	+	+	-	-
18	Accipitriformes	Shikra	*Accipiter badius*	+	+	+	-
19	Accipitriformes	Short-toed Snake-Eagle	*Circaetus gallicus*	+	+	+	-
20	Accipitriformes	Steppe Eagle	*Aquila nipalensis*	+	+	-	-
21	Accipitriformes	Western Marsh Harrier	*Circus aeruginosus*	n	+	+	-
22	Accipitriformes	White-eyed Buzzard	*Butastur teesa*	+	+	+	-
23	Accipitriformes	White-rumped Vulture	*Gyps bengalensis*	+	+	-	-
24	Anseriformes	Bar-headed Goose	*Anser indicus*	+	+	-	-
25	Anseriformes	Common Pochard	*Aythya ferina*	+	+	+	-
26	Anseriformes	Cotton Pygmy-Goose	*Nettapus coromandelianus*	+	+	+	-
27	Anseriformes	Eurasian Wigeon	*Mareca penelope*	-	+	-	-
28	Anseriformes	Ferruginous Duck	*Aythya nyroca*	+	-	-	-
29	Anseriformes	Gadwall	*Mareca strepera*	+	+	-	-
30	Anseriformes	Garganey	*Spatula querquedula*	-	+	-	-
31	Anseriformes	Graylag Goose	*Anser anser*	-	+	-	-
32	Anseriformes	Green-winged Teal	*Anas crecca*	+	+	-	-

SN	Order	Bird Name	Scientific Name	Dongargarh	Dhara forest	Bortalav	Paniya - job
33	Anseriformes	Indian Spot-billed Duck	*Anas poecilorhyncha*	+	+	+	-
34	Anseriformes	Knob-billed Duck	*Sarkidiornis melanotos*	-	+	-	-
35	Anseriformes	Lesser Whistling-Duck	*Dendrocygna javanica*	+	+	+	-
36	Anseriformes	Northern Pintail	*Anas acuta*	+	+	-	-
37	Anseriformes	Northern Shoveler	*Spatula clypeata*	-	+	-	-
38	Anseriformes	Red-crested Pochard	*Netta rufina*	+	+	-	-
39	Anseriformes	Ruddy Shelduck	*Tadorna ferruginea*	+	+	+	-
40	Anseriformes	Tufted Duck	*Aythya fuligula*	-	+	-	-
41	Apodiformes	Alpine Swift	*Apus melba*	+	-	-	-
42	Apodiformes	Asian Palm Swift	*Cypsiurus balasiensis*	+	-	-	-
43	Apodiformes	Crested Treeswift	*Hemiprocne coronata*	+	-	+	-
44	Apodiformes	Little Swift	*Apus affinis*	+	-	+	-
45	Bucerotiformes	Eurasian Hoopoe	*Upupa epops*	+	-	-	-
46	Bucerotiformes	Indian Gray Hornbill	*Ocyceros birostris*	+	+	+	-
47	Bucerotiformes	Malabar Pied-Hornbill	*Anthracoceros coronatus*	-	-	+	-
48	Caprimulgiformes	Indian Nightjar	*Caprimulgus asiaticus*	+	+	-	-
49	Caprimulgiformes	Jungle Nightjar	*Caprimulgus indicus*	+	-	+	-
50	Caprimulgiformes	Savanna Nightjar	*Caprimulgus affinis*	-	-	+	-
51	Charadriiformes	Barred Buttonquail	*Turnix suscitator*	+	+	-	-
52	Charadriiformes	Black-winged Stilt	*Himantopus himantopus*	+	+		-
53	Charadriiformes	Bronze-winged Jacana	*Metopidius indicus*	+	+	+	-
54	Charadriiformes	Brown-headed Gull	*Chroicocephalus brunnicephalus*	-	-	+	-
55	Charadriiformes	Common Greenshank	*Tringa nebularia*	+	+	-	-
56	Charadriiformes	Common Redshank	*Tringa totanus*	-	+	-	-
57	Charadriiformes	Common Sandpiper	*Actitis hypoleucos*	+	+	+	-
58	Charadriiformes	Common Snipe	*Gallinago gallinago*	+	+	-	-
59	Charadriiformes	Curlew Sandpiper	*Calidris ferruginea*	-	+	-	-
60	Charadriiformes	Dunlin	*Calidris alpina*	+	-	-	-
61	Charadriiformes	Greater Painted-Snipe	*Rostratula benghalensis*	+	+	-	-
62	Charadriiformes	Green Sandpiper	*Tringa ochropus*	-	+	+	-
63	Charadriiformes	Indian Courser	*Cursorius coromandelicus*	+	-	-	-
64	Charadriiformes	Indian Thick-knee	*Burhinus indicus*	+	+	+	-
65	Charadriiformes	Kentish Plover	*Charadrius alexandrinus*	+	+	-	-

SN	Order	Bird Name	Scientific Name	Dongargarh	Dhara forest	Bortalav	Paniya - job
66	Charadriiformes	Little Ringed Plover	*Charadrius dubius*	+	+	+	-
67	Charadriiformes	Little Stint	*Calidris minuta*	-	-	-	-
68	Charadriiformes	Little Tern	*Sternula albifrons*	-	-	+	-
69	Charadriiformes	Marsh Sandpiper	*Tringa stagnatilis*	-	+	-	-
70	Charadriiformes	Oriental Pratincole	*Glareola maldivarum*	-	+	-	-
71	Charadriiformes	Pacific Golden-Plover	*Pluvialis fulva*	-	-	+	-
72	Charadriiformes	Pheasant-tailed Jacana	*Hydrophasianus chirurgus*	+	-	-	-
73	Charadriiformes	Pied Avocet	*Recurvirostra avosetta*	-	+	-	-
74	Charadriiformes	Red-wattled Lapwing	*Vanellus indicus*	+	+	+	-
75	Charadriiformes	River Tern	*Sterna aurantia*	+	+	+	-
76	Charadriiformes	Small Pratincole	*Glareola lactea*	+	+	-	-
77	Charadriiformes	Spotted Redshank	*Tringa erythropus*	+	+	-	-
78	Charadriiformes	Temminck's Stint	*Calidris temminckii*	+	-	-	-
79	Charadriiformes	Whiskered Tern	*Chlidonias hybrida*	-	+	-	+
80	Charadriiformes	Wood Sandpiper	*Tringa glareola*	+	+	-	+
81	Charadriiformes	Yellow-wattled Lapwing	*Vanellus malabaricus*	+	+	+	+
82	Ciconiiformes	Asian Openbill	*Anastomus oscitans*	+	+	+	+
83	Ciconiiformes	Asian Woolly-necked Stork	*Ciconia episcopus*	-	+	+	+
84	Ciconiiformes	Black Stork	*Ciconia nigra*	+	-	+	-
85	Ciconiiformes	Painted Stork	*Mycteria leucocephala*	+	+	-	-
86	Columbiformes	Eurasian Collared-Dove	*Streptopelia decaocto*	+	+	+	+
87	Columbiformes	Laughing Dove	*Spilopelia senegalensis*	+	+	+	+
88	Columbiformes	Oriental Turtle-Dove	*Streptopelia orientalis*	+	+	+	+
89	Columbiformes	Red Collared-Dove	*Streptopelia tranquebarica*	+	+	+	+
90	Columbiformes	Rock Pigeon	*Columba livia*	+	+	+	+
91	Columbiformes	Spotted Dove	*Spilopelia chinensis*	+	+	+	+
92	Columbiformes	Yellow-footed Green-Pigeon	*Treron phoenicopterus*	+	+	+	+
93	Coraciiformes	Asian Green Bee-eater	*Merops orientalis*	+	+	+	+
94	Coraciiformes	Blue-tailed Bee-eater	*Merops philippinus*	+	+	-	-
95	Coraciiformes	Chestnut-headed Bee-eater	*Merops leschenaulti*	+	-	-	+
96	Coraciiformes	Common Kingfisher	*Alcedo atthis*	+	+	+	+
97	Coraciiformes	Indian Roller	*Coracias benghalensis*	+	+	+	+
98	Coraciiformes	Pied Kingfisher	*Ceryle rudis*	+	+	+	+

SN	Order	Bird Name	Scientific Name	Dongargarh	Dhara forest	Bortalav	Paniya - job
99	Coraciiformes	White-throated Kingfisher	*Halcyon smyrnensis*	+	+	+	+
100	Cuculiformes	Asian Koel	*Eudynamys scolopaceus*	+	+	+	+
101	Cuculiformes	Common Cuckoo	*Cuculus canorus*	+	+	+	-
102	Cuculiformes	Common Hawk-Cuckoo	*Hierococcyx varius*	+	+	+	+
103	Cuculiformes	Fork-tailed Drongo-Cuckoo	*Surniculus dicruroides*	+	-	-	-
104	Cuculiformes	Gray-bellied Cuckoo	*Cacomantis passerinus*	+	+	+	-
105	Cuculiformes	Greater Coucal	*Centropus sinensis*	+	+	+	+
106	Cuculiformes	Indian Cuckoo	*Cuculus micropterus*	+	+	+	+
107	Cuculiformes	Pied Cuckoo	*Clamator jacobinus*	+	+	-	+
108	Falconiformes	Eurasian Kestrel	*Falco tinnunculus*	-	+	-	-
109	Falconiformes	Peregrine Falcon	*Falco peregrinus*	-	+	-	-
110	Galliformes	Gray Francolin	*Ortygornis pondicerianus*	+	+	+	+
111	Galliformes	Indian Peafowl	*Pavo cristatus*	+	+	+	+
112	Galliformes	Painted Francolin	*Francolinus pictus*	+	+	+	+
113	Galliformes	Painted Spurfowl	*Galloperdix lunulata*	+	+	+	+
114	Galliformes	Rain Quail	*Coturnix coromandelica*	-	-	-	-
115	Galliformes	Red Junglefowl	*Gallus gallus*	+	+	+	+
116	Galliformes	Red Spurfowl	*Galloperdix spadicea*	+	-	-	+
117	Gruiformes	Brown Crake	*Amaurornis akool*	+	+	-	-
118	Gruiformes	Common Crane	*Grus grus*	+		-	-
119	Gruiformes	Eurasian Coot	*Fulica atra*	+	+	-	-
120	Gruiformes	Eurasian Moorhen	*Gallinula chloropus*	+	+	+	-
121	Gruiformes	Gray-headed Swamphen	*Porphyrio poliocephalus*	+	+	+	-
122	Gruiformes	Ruddy-breasted Crake	*Zapornia fusca*	-	+	-	-
123	Gruiformes	Slaty-breasted Rail	*Lewinia striata*	+	-	-	-
124	Gruiformes	Watercock	*Gallicrex cinerea*	-	+	-	-
125	Gruiformes	White-breasted Waterhen	*Amaurornis phoenicurus*	+	**+**	**+**	**+**
126	Gruiformes	Yellow-legged Buttonquail	*Turnix tanki*	+	-	--	-
127	Passeriformes	Ashy Drongo	*Dicrurus leucophaeus*	+	+	+	+
128	Passeriformes	Ashy Prinia	*Prinia socialis*	+	+	+	+
129	Passeriformes	Ashy-crowned Sparrow-Lark	*Eremopterix griseus*	+	+	+	+
130	Passeriformes	Asian Brown Flycatcher	*Muscicapa dauurica*	+	-	-	-
131	Passeriformes	Bank Myna	*Acridotheres ginginianus*	+	-	-	-

SN	Order	Bird Name	Scientific Name	Dongargarh	Dhara forest	Bortalav	Paniya - job
132	Passeriformes	Barn Swallow	*Hirundo rustica*	+	+	+	+
133	Passeriformes	Baya Weaver	*Ploceus philippinus*	+	+	+	+
134	Passeriformes	Bay-backed Shrike	*Lanius vittatus*	+	+	+	+
135	Passeriformes	Black Drongo	*Dicrurus macrocercus*	+	+	+	+
136	Passeriformes	Black Redstart	*Phoenicurus ochruros*	+	+	-	+
137	Passeriformes	Black-headed Bunting	*Emberiza melanocephala*	+	-	-	-
138	Passeriformes	Black-headed Cuckooshrike	*Lalage melanoptera*	+	+	+	+
139	Passeriformes	Black-hooded Oriole	*Oriolus xanthornus*	+	+	+	+
140	Passeriformes	Black-naped Monarch	*Hypothymis azurea*	+	+	+	+
141	Passeriformes	Black-naped Oriole	*Oriolus chinensis*	-	+	-	-
142	Passeriformes	Black-winged Cuckooshrike	*Lalage melaschistos*	+	-	-	+
143	Passeriformes	Blue Rock-Thrush	*Monticola solitarius*	+	-	-	
144	Passeriformes	Blue-capped Rock-Thrush	*Monticola cinclorhyncha*	+	+	-	+
145	Passeriformes	Bluethroat	*Luscinia svecica*	+	+	-	+
146	Passeriformes	Blyth's Pipit	*Anthus godlewskii*	+	+	-	
147	Passeriformes	Blyth's Reed Warbler	*Acrocephalus dumetorum*	+	+	+	+
148	Passeriformes	Booted Warbler	*Iduna caligata*	+			
149	Passeriformes	Brahminy Starling	*Sturnia pagodarum*	+	+	+	+
150	Passeriformes	Brown Rock Chat	*Oenanthe fusca*	+	+	+	+
151	Passeriformes	Brown Shrike	*Lanius cristatus*	+	-	+	+
152	Passeriformes	Brown-cheeked Fulvetta	*Alcippe poioicephala*	-	-	+	+
153	Passeriformes	Chestnut-tailed Starling	*Sturnia malabarica*	+	+	+	+
154	Passeriformes	Cinereous Tit	*Parus cinereus*	+	+	+	+
155	Passeriformes	Citrine Wagtail	*Motacilla citreola*	-	-	+	-
156	Passeriformes	Clamorous Reed Warbler	*Acrocephalus stentoreus*	-	+	+	-
157	Passeriformes	Common Babbler	*Turdoides caudata*	+	+	+	+
158	Passeriformes	Common Chiffchaff	*Phylloscopus collybita*	+	-	+	-
159	Passeriformes	Common Iora	*Aegithina tiphia*	+	+	+	+
160	Passeriformes	Common Myna	*Acridotheres tristis*	+	+	+	+
161	Passeriformes	Common Tailorbird	*Orthotomus sutorius*	+	+	+	+
162	Passeriformes	Common Woodshrike	*Tephrodornis pondicerianus*	+	+	+	+
163	Passeriformes	Crested Bunting	*Emberiza lathami*	+	-	-	-
164	Passeriformes	Dusky Crag-Martin	*Ptyonoprogne concolor*	+	-	-	-

SN	Order	Bird Name	Scientific Name	Dongargarh	Dhara forest	Bortalav	Paniya - job
165	Passeriformes	Eastern Orphean Warbler	*Sylvia crassirostris*	+	-	-	-
166	Passeriformes	Golden-fronted Leafbird	*Chloropsis aurifrons*	+	+	+	+
167	Passeriformes	Gray Wagtail	*Motacilla cinerea*	+	+	+	+
168	Passeriformes	Gray-breasted Prinia	*Prinia hodgsonii*	+	+	+	
169	Passeriformes	Gray-headed Canary-Flycatcher	*Culicicapa ceylonensis*	+	-	-	-
170	Passeriformes	Gray-necked Bunting	*Emberiza buchanani*	+	-	-	-
171	Passeriformes	Gray-throated Martin	*Riparia chinensis*	+	-	-	-
172	Passeriformes	Great Gray Shrike	*Lanius excubitor*	+	-	-	-
173	Passeriformes	Greater Racket-tailed Drongo	*Dicrurus paradiseus*	+	+	+	+
174	Passeriformes	Green Warbler	*Phylloscopus nitidus*	+			
175	Passeriformes	Greenish Warbler	*Phylloscopus trochiloides*	+	+	+	+
176	Passeriformes	Indian Blackbird	*Turdus simillimus*	+	-	-	-
177	Passeriformes	Indian Bushlark	*Mirafra erythroptera*	+	+	+	-
178	Passeriformes	Indian Golden Oriole	*Oriolus kundoo*	+	+	+	+
179	Passeriformes	Indian Nuthatch	*Sitta castanea*	-		+	+
180	Passeriformes	Indian Paradise-Flycatcher	*Terpsiphone paradisi*	+	+	+	+
181	Passeriformes	Indian Pied Starling	*Gracupica contra*	+	+	+	+
182	Passeriformes	Indian Pitta	*Pitta brachyura*	+	-	+	+
183	Passeriformes	Indian Robin	*Saxicoloides fulicata*	+	+	+	+
184	Passeriformes	Indian Scimitar-Babbler	*Pomatorhinus horsfieldii*				+
185	Passeriformes	Indian Silverbill	*Euodice malabarica*	+	+	+	+
186	Passeriformes	Indian White-eye	*Zosterops palpebrosus*	+	+	+	+
187	Passeriformes	Indian Yellow Tit	*Machlolophus xanthogenys*	-			+
188	Passeriformes	Jerdon's Leafbird	*Chloropsis jerdoni*	+	+	+	+
189	Passeriformes	Jungle Babbler	*Turdoides striatus*	+	+	+	+
190	Passeriformes	Jungle Prinia	*Prinia sylvatica*	+	+	+	+
191	Passeriformes	Large Cuckooshrike	*Coracina macei*	+	+	+	+
192	Passeriformes	Large Gray Babbler	*Argya malcolmi*	+	+	+	+
193	Passeriformes	Large-billed Crow	*Corvus macrorhynchos*	+	+	+	+
194	Passeriformes	Lesser Whitethroat	*Curruca curruca*	+	+	-	-
195	Passeriformes	Long-tailed Shrike	*Lanius schach*	+	-	+	+

SN	Order	Bird Name	Scientific Name	Dongargarh	Dhara forest	Bortalav	Paniya - job
196	Passeriformes	Mongolian Short-toed Lark	*Calandrella dukhunensis*	-	+	-	-
197	Passeriformes	Olive-backed Pipit	*Anthus hodgsoni*	+	+	+	+
198	Passeriformes	Orange-headed Thrush	*Geokichla citrina*	+	+	-	+
199	Passeriformes	Oriental Magpie-Robin	*Copsychus saularis*	+	+	+	+
200	Passeriformes	Oriental Skylark	*Alauda gulgula*	-	-	-	-
201	Passeriformes	Paddyfield Pipit	*Anthus rufulus*	+	+	+	+
202	Passeriformes	Paddyfield Warbler	*Acrocephalus agricola*	+	+	+	+
203	Passeriformes	Pale-billed Flowerpecker	*Dicaeum erythrorhynchos*	+	+	-	-
204	Passeriformes	Pied Bushchat	*Saxicola caprata*	+	+	+	+
205	Passeriformes	Plain Prinia	*Prinia inornata*	+	+	+	+
206	Passeriformes	Puff-throated Babbler	*Pellorneum ruficeps*	+	-	-	+
207	Passeriformes	Purple Sunbird	*Cinnyris asiaticus*	+	+	+	+
208	Passeriformes	Purple-rumped Sunbird	*Leptocoma zeylonica*	+	-	+	+
209	Passeriformes	Red Avadavat	*Amandava amandava*	+	-	-	-
210	Passeriformes	Red-breasted Flycatcher	*Ficedula parva*	+	+	-	-
211	Passeriformes	Red-headed Bunting	*Emberiza bruniceps*	-	-	+	-
212	Passeriformes	Red-rumped Swallow	*Cecropis daurica*	+	+	-	-
213	Passeriformes	Red-vented Bulbul	*Pycnonotus cafer*	+	+	+	+
214	Passeriformes	Red-whiskered Bulbul	*Pycnonotus jocosus*	+	-	-	+
215	Passeriformes	Rosy Starling	*Pastor roseus*	+	+	-	+
216	Passeriformes	Rufous Treepie	*Dendrocitta vagabunda*	+	+	+	+
217	Passeriformes	Rufous-tailed Lark	*Ammomanes phoenicura*	+	+	+	+
218	Passeriformes	Scaly-breasted Munia	*Lonchura punctulata*	+	+	+	+
219	Passeriformes	Scarlet Minivet	*Pericrocotus flammeus*	-	-	-	+
220	Passeriformes	Siberian Stonechat	*Saxicola maurus*	-	+	+	-
221	Passeriformes	Small Minivet	*Pericrocotus cinnamomeus*	+	-	+	+
222	Passeriformes	Spot-breasted Fantail	*Rhipidura albogularis*	-	+	-	-
223	Passeriformes	Streak-throated Swallow	*Petrochelidon fluvicola*	-	-	-	+
224	Passeriformes	Sulphur-bellied Warbler	*Phylloscopus griseolus*	+	+	-	+
225	Passeriformes	Sykes's Warbler	*Iduna rama*	-	+	-	-
226	Passeriformes	Taiga Flycatcher	*Ficedula albicilla*	+	+	-	+
227	Passeriformes	Tawny Pipit	*Anthus campestris*	+	-	-	-
228	Passeriformes	Thick-billed Flowerpecker	*Dicaeum agile*	+	+	+	+

SN	Order	Bird Name	Scientific Name	Dongargarh	Dhara forest	Bortalav	Paniya - job
229	Passeriformes	Tickell's Blue Flycatcher	*Cyornis tickelliae*	+	+	-	+
230	Passeriformes	Tickell's Leaf Warbler	*Phylloscopus affinis*	-	+	-	-
231	Passeriformes	Tickell's Thrush	*Turdus unicolor*	+	+	-	+
232	Passeriformes	Tree Pipit	*Anthus trivialis*	-	+	-	
233	Passeriformes	Tricolored Munia	*Lonchura malacca*	+	+	-	+
234	Passeriformes	Ultramarine Flycatcher	*Ficedula superciliaris*		+		+
235	Passeriformes	Verditer Flycatcher	*Eumyias thalassinus*	+	+	+	+
236	Passeriformes	Western Crowned Warbler	*Phylloscopus occipitalis*	+	-	-	+
237	Passeriformes	Western Yellow Wagtail	*Motacilla flava*	+	-	-	+
238	Passeriformes	White Wagtail	*Motacilla alba*	+	+	-	+
239	Passeriformes	White-bellied Drongo	*Dicrurus caerulescens*	+	+	+	+
240	Passeriformes	White-browed Bulbul	*Pycnonotus luteolus*	+	+	+	+
241	Passeriformes	White-browed Fantail	*Rhipidura aureola*	+	+	+	+
242	Passeriformes	White-browed Wagtail	*Motacilla maderaspatensis*	-	+	-	-
243	Passeriformes	White-rumped Munia	*Lonchura striata*	+	-	+	+
244	Passeriformes	White-rumped Shama	*Copsychus malabaricus*	-	+	-	+
245	Passeriformes	Wire-tailed Swallow	*Hirundo smithii*	+	+	+	+
246	Passeriformes	Yellow-eyed Babbler	*Chrysomma sinense*	+	+	-	-
247	Passeriformes	Yellow-throated Sparrow	*Gymnoris xanthocollis*	+	+	+	+
248	Passeriformes	Zitting Cisticola	*Cisticola juncidis*	+	+	+	+
249	Pelecaniformes	Black Bittern	*Dupetor flavicollis*	-	+	+	-
250	Pelecaniformes	Black-crowned Night Heron	*Nycticorax nycticorax*	+	+	+	+
251	Pelecaniformes	Black-headed Ibis	*Threskiornis melanocephalus*	+	+	+	+
252	Pelecaniformes	Cinnamon Bittern	*Ixobrychus cinnamomeus*	+	+	+	-
253	Pelecaniformes	Eastern Cattle Egret	*Bubulcus coromandus*	+	+	+	-
254	Pelecaniformes	Eurasian Spoonbill	*Platalea leucorodia*	+	-	-	-
255	Pelecaniformes	Gray Heron	*Ardea cinerea*	+	+	+	+
256	Pelecaniformes	Great Cormorant	*Phalacrocorax carbo*	+	+	-	+
257	Pelecaniformes	Great Egret	*Ardea alba*	+	+	+	+
258	Pelecaniformes	Indian Cormorant	*Phalacrocorax fuscicollis*	+	+	+	+
259	Pelecaniformes	Indian Pond-Heron	*Ardeola grayii*	+	+	+	+
260	Pelecaniformes	Little Cormorant	*Microcarbo niger*	+	+	+	+
261	Pelecaniformes	Little Egret	*Egretta garzetta*	+	+	+	+

SN	Order	Bird Name	Scientific Name	Dongargarh	Dhara forest	Bortalav	Paniya - job
262	Pelecaniformes	Medium Egret	*Ardea intermedia*	+	+	+	+
263	Pelecaniformes	Purple Heron	*Ardea purpurea*	+	+	+	-
264	Pelecaniformes	Red-naped Ibis	*Pseudibis papillosa*	+	+	+	+
265	Pelecaniformes	Striated Heron	*Butorides striata*	-	+	-	+
266	Pelecaniformes	Yellow Bittern	*Ixobrychus sinensis*	+	+	-	+
267	Piciformes	Black-rumped Flameback	*Dinopium benghalense*	+	+	+	+
268	Piciformes	Brown-capped Pygmy Woodpecker	*Yungipicus nanus*	+	+	+	+
269	Piciformes	Brown-headed Barbet	*Psilopogon zeylanicus*	-	+	+	+
270	Piciformes	Coppersmith Barbet	*Psilopogon haemacephalus*	+	+	+	+
271	Piciformes	Eurasian Wryneck	*Jynx torquilla*	+	-	-	-
272	Piciformes	Rufous Woodpecker	*Micropternus brachyurus*	-	-	-	+
273	Piciformes	Streak-throated Woodpecker	*Picus xanthopygaeus*	-	-	-	+
274	Piciformes	White-naped Woodpecker	*Chrysocolaptes festivus*	-	-	-	+
275	Piciformes	Yellow-crowned Woodpecker	*Leiopicus mahrattensis*	+	-	+	+
276	Podicipediformes	Great Crested Grebe	*Podiceps cristatus*	-	+	-	-
277	Podicipediformes	Little Grebe	*Tachybaptus ruficollis*	+	-	+	+
278	Psittaciformes	Alexandrine Parakeet	*Psittacula eupatria*	+	-	+	+
279	Psittaciformes	Plum-headed Parakeet	*Psittacula cyanocephala*	+	+	+	+
280	Psittaciformes	Rose-ringed Parakeet	*Psittacula krameri*	+	+	+	+
281	Pterocliformes	Painted Sandgrouse	*Pterocles indicus*	-	+	-	-
282	Strigiformes	Barn Owl	*Tyto alba*	+	+	+	-
283	Strigiformes	Brown Fish-Owl	*Ketupa zeylonensis*	+	+	-	-
284	Strigiformes	Indian Scops-Owl	*Otus bakkamoena*	+	+	-	-
285	Strigiformes	Jungle Owlet	*Glaucidium radiatum*	+	+	+	+
286	Strigiformes	Mottled Wood-Owl	*Strix ocellata*	+	-	-	-
287	Strigiformes	Rock Eagle-Owl	*Bubo bengalensis*	+	-	-	-
288	Strigiformes	Spotted Owlet	*Athene brama*	+	+	+	+
289	Suliformes	Oriental Darter	*Anhinga melanogaster*	+	-	-	-

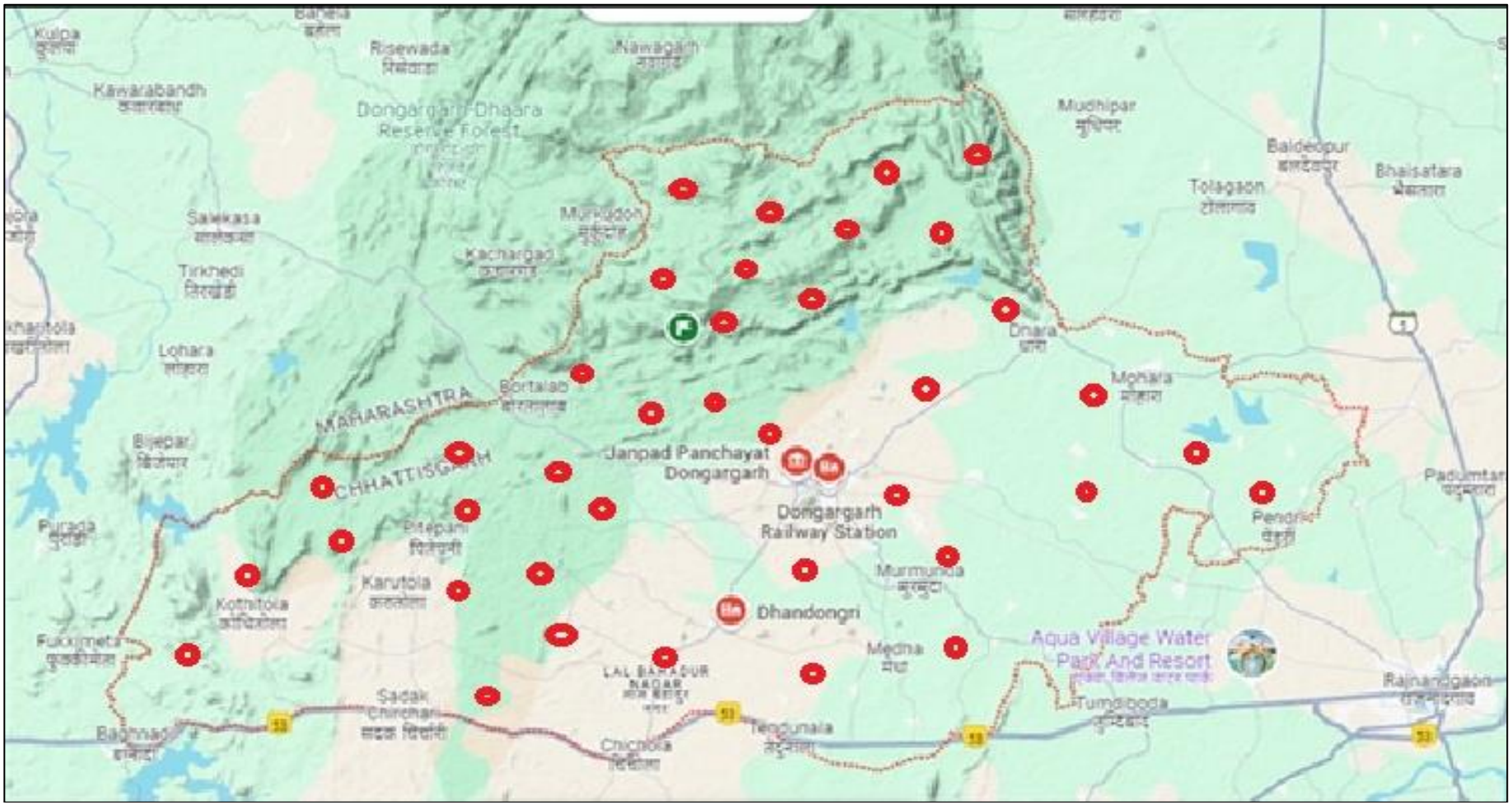

Fig. 2. Distribution of 289 Species in Study Area
Red illustration shows distribution of birds in study area.

4. RESULTS AND DISCUSSION

In the Dongargarh-Dhaara Forest, our extensive field surveys and data collection have yielded of an avian species. Over the course of the study, (289) bird species have been documented [From, Fig.2] encompassing a diverse range of families, genera, and habitats. This checklist provides a snapshot of the avian biodiversity within the reserve and highlights the ecological significance of various bird species [28]. *Passeriformes*, the largest order represented, including a rich variety of songbirds and insectivores. Notable species include the[*Dicrurus leucophaeus*] and [*Eremopterix griseus*] [From,Table1], which are commonly observed in the forest's diverse habitats.*Accipitriformes*, birds of prey such as the [*Neophron percnopterus*] and [*Ichthyophaga ichthyaetus*], which are essential for maintaining ecological balance through their predatory roles.Columbiformes, pigeons and doves like the [*Columba livia*], which contribute to seed dispersal and are integral to the forest's plant regeneration processes.Charadriiformes, shorebirds and waders observed in riparian zones, including the [*Tringa nebularia*] and [*Chroicocephalus brunnicephalus*], highlighting the importance of wetland habitats.*Dense Forest Canopies,* species such as the [*Eudynamys scolopaceus*] and [*Falco tinnunculus*] [From,Table1] are predominantly found in the upper canopy layers, where they feed on insects and fruits.*Open Grasslands and Scrublands*, birds like the [Pavo cristatus] thrive in these areas, exploiting the open terrain for foraging and nesting [29]. *Riparian Zones*, water-associated species, including the [*Zapornia fusca*] and [*Otus bakkamoena*] [From,Table1], are concentrated along rivers and streams, utilizing these environments for feeding and breeding.*Migratory Patterns*, certain species, such as the [*Strix ocellata*] [From,Table1], are observed only during specific migratory seasons, reflecting their reliance on the reserve as a stopover or breeding ground.Several bird species, such as [*Anhinga melanogaster*] [From,Table1], serve as indicators of environmental health. Changes in their populations can reflect shifts in habitat quality and broader ecological changes.Certain birds, including [*Athene brama*], act as keystone species, significantly influencing the structure and function of their habitats[30]. Their predatory or competitive behaviors can affect the abundance and diversity of other species.

4.1 Conservation Implications

The diverse range of habitats utilized by the avian species emphasizes the need for comprehensive habitat protection and management [31]. Ensuring the preservation of key areas, such as riparian zones and dense forest canopies [From, Table 1], is crucial for maintaining avian biodiversity [32]. Identifying threats such as habitat destruction, climate change, and human encroachment is essential for developing effective conservation strategies. For instance, the presence of threatened species like [21 Orders from Table 1] indicates the need for targeted conservation actions.Engaging local communities in conservation efforts and raising awareness about the importance of avian biodiversity can enhance protection measures and foster a sense of stewardship [33,34].

5. CONCLUSION

The detailed checklist of native avian fauna in the Dongargarh-Dhaara Forest provides a foundational understanding of the region's avian biodiversity. The results underscore the ecological significance of this reserve and highlight the importance of ongoing conservation efforts. By addressing the challenges and opportunities identified, we can work towards preserving the rich avian heritage of Dongargarh-Dhaara and ensuring the continued health of its ecosystems. The Dongargarh-Dhaara Forest stands as a vital natural asset in Chhattisgarh, teeming with avian life that reflects its rich ecological tapestry. The development of a detailed checklist of native avian fauna is a critical step in preserving this biodiversity and ensuring the long-term health of the forest. By documenting and understanding the bird species that inhabit this reserve, we contribute to the broader goals of conservation, ecological research, and environmental education. This endeavour not only enriches our knowledge of the region's natural heritage but also fosters a deeper appreciation for the intricate balance of life within the Dongargarh-Dhaara Forest.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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