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Study on Avian Fauna of Morgaon Region of Pune (Maharashtra), India

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Abstract: The bird diversity has contributed significantly to the environment and ecosystem by providing services like biological control, seed dissemination, environmental cleaners and aesthetic beauty. They also act as an indicator of environmental change, revealing the well-being of their habitat. Currently bird diversity is getting declined due to major threats such as the use of pesticide, habitat loss, illegal hunting etc. The present work has revealed avian diversity of Morgaon region of Pune district. A total of 197 species belonging to 20 orders and 59 families have been reported. Among 197 species, four vulnerable species namely River Tern *Sterna aurantia*, Greater Spotted Eagle *Clanga clanga*, Common Pochard *Aythya ferina* and Tawny Eagle *Aquila rapax*; two endangered species namely Steppe Eagle *Aquila nipalensis* and Egyptian Vulture *Neophron percnopterus*; and five near-threatened species namely Black-headed Ibis *Threskiornis melanocephalus*, Pallid Harrier *Circus macrourus*, Asian Woolly-necked Stork *Ciconia episcopus*, Alexandrine Parakeet *Psittacula eupatria* and Red-necked Falcon *Falco chicquera* were found at the study area.

Keywords: Birds, Diversity, IUCN status, Dietary pattern, Threatened species

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Introduction

The bird diversity has contributed significantly to the environment and ecosystem by providing services like biological control, seed dissemination, environmental cleaners and aesthetic beauty (Abbas *et al.*, 2019). It plays a critical role in maintaining the health of our planet's ecosystems. Many bird species, like hummingbirds and honeyeaters helps in pollination. During nectar feeding, they pick up pollen and transfer it from one flower to another, enabling fertilization

and seed production which is essential for the reproduction of many flowering plants, including many food crops (Cronk and Ojeda, 2008). Insectivorous birds like swallows, flycatchers, and warblers consume hundreds of insect pests per day, reducing the need for chemical pesticides and protecting crops from damage (Møller *et al.*, 2021). Birds like vultures, crows, and ravens play a vital role in cleaning up the environment by consuming carrion (dead animals). This helps to

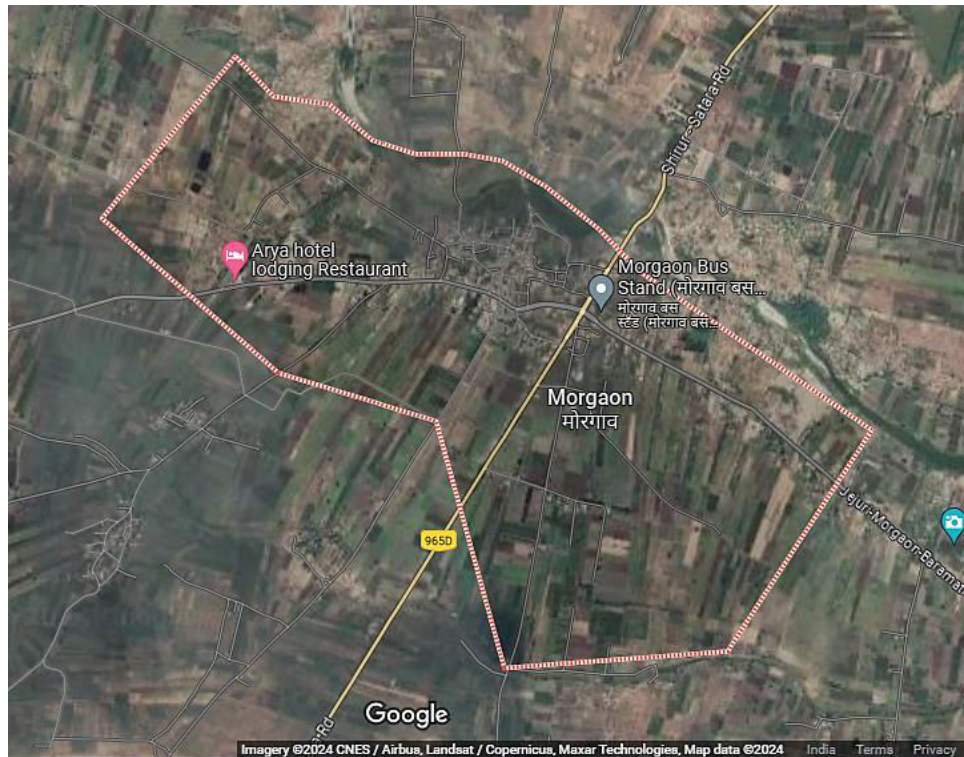


Fig. 1: Map of Morgaon village (Source: Google).

decompose organic matter, recycle nutrients, and prevent the spread of diseases (Inger *et al.*, 2016).

Birds also act as indicators of environmental change, revealing the well-being of their habitat. Studying their diversity allows us to assess the overall health of ecosystems, pinpoint threats like habitat loss or climate change, and predict potential cascading effects. This knowledge empowers us to make informed decisions for conservation, ensuring not only bird survival but also the delicate balance of the environment (Mekonen, 2017). Currently bird diversity is getting declined due to major threats which include the use of pesticide, habitat loss, illegal hunting etc. The primary cause of habitat loss is increased stress on agricultural fields and wetlands. Unregulated human activities such as agricultural activities, grazing of livestock, and townships have reduced wetland size and fragmented wetlands, resulting in undesirable habitat.

In comparison to savanna patches, the

vegetation analysis revealed that exotic plantations have a higher dominance with a lower richness of woody plant species. Also savanna patches showed higher proportion of omnivore birds and a lower proportion of herbivore and predatory birds in the exotic plantations. It is also demonstrated that exotic plantations affect both native plant community structure as well as bird fauna (Choudaj and Wankhade, 2021).

There are over 11,000 bird species worldwide. Approximately 1262 of them were recorded from India till 2016. According to the IUCN Red List, around 13% of all birds worldwide are listed in IUCN. It is fascinating to note that, according to IUCN Red List and BirdLife International, 14% of bird species in India are listed as threatened or near threatened (Rahmani, 2022). According to the updated report, India has become a home for about 1364 species of bird among which 81 species are endemic to India (Nidhi *et al.*, 2023).

The present work has been conducted on

avian diversity of Morgaon region of Pune district, Maharashtra, India with respect to fauna, conservation status and feeding habit.

Materials and Methods

Study area:

The Morgaon is a village located in Baramati tehsil of Pune District, Western Maharashtra at 18° 16' 21.53" N and 74° 19' 14.22" E situated at 65 km away from district headquarter Pune and 32 km away from sub-district headquarter Baramati (Fig. 1). The total geographical area of village is about 2306 hectares. It is famous for the Shri Mayureshwar (or Moreshwar) Ganpati temple which is one of the Ashtavinayakas (Eight sacred Ganapati temples) in Maharashtra, India. The village has a varied habitat mosaic comprising agricultural fields, orchards, scrublands, and small water bodies like streams, lakes, etc. This diverse environment creates an ideal setting for a rich avifaunal community, with numerous bird species thriving in different niches.

Method:

The field survey was conducted from January 2022 to December 2023 on every Sunday at morning between 6.30 am to 09:30 am and in the evening between 4.00 pm to 6:30 pm. Line transect method was used during field survey using transect of 100 m. Survey was conducted throughout the agricultural fields, scrublands, and small water bodies like streams, lakes of Morgaon village. Observations on field characteristics of each bird were noted on field data sheet with the help of field binocular Celestron 71232 G2 10x25 Upclose Roof Binocular and by listening their voice. The recorded birds were identified by using standard field guides and key reference books (Ali and Ripley, 1987; Grimmett *et al.*, 2001; Ali, 2002; Grimmett *et al.*, 2016).

On the other hand, data about avian diversity from January 2017 to December 2021 was taken from the eBIRD database (<http://www.ebird.org>; Sullivan *et al.*, 2009). The IUCN conservation status was checked with the help of IUCN web portal (<https://www.iucnredlist.org>) and noted

down on the datasheet.

Results

The present work revealed the presence of 197 different species of birds from Morgaon village of Maharashtra state. Among species are belonging to 20 orders and 59 families. The order Passeriformes found to be dominant with 90 species contributing about 45.69% composition followed by Accipitriformes, Charadriiformes, Pelecaniformes and Anseriformes with 17 (8.63%), 15 (7.61%), 12 (6.09%) and 11 (5.58%) species, respectively. All remaining orders showed less than 10 species. The order Cuculiformes and Galliformes representing 6 species (3.05%) each followed by order Columbiformes with 5 species (2.54%), order Ciconiiformes with 4 species (2.03%), orders Suliformes, Falconiformes, Caprimulgiformes and Psittaciformes with 3 species (1.52%) each. The order Pteroclidiformes, Bucerotiformes, Piciformes and Strigiformes were representing 2 species (1.02%) each. The only 1 species was noticed from order Podicipediformes with 0.51% contribution in avifauna (Table 1; Fig. 2).

Comparative analysis between families showed that family Accipitridae and Anatidae representing high species number and was 17 (8.63%) and 11 (5.58%), respectively. All remaining families were noticed to showing less than 10 different species in the study area. Family Ardeidae was representing a total of 8 species (4.06%) followed by Cisticolidae and Scolopacidae with 7 species (3.55%) each; family Alaudidae, Cuculidae and Phasianidae with 6 species (3.05%) each; family Acrocephalidae, Columbidae, Rallidae, Emberizidae and Hirundinidae with 5 species (2.54%) each; family Ciconiidae, Sturnidae, Threskiornithidae and Estrildidae with 4 species (2.03%) each; family Campephagidae, Charadriidae, Falconidae, Leiothrichidae, Phalacrocoracidae, Sylviidae and Psittaculidae with 3 species (1.52) each and family Alcedinidae, Apodidae, Coraciidae, Corvidae, Dicruridae, Phylloscopidae, Nectariniidae, Passeridae, Pteroclididae, Pycnonotidae with 2 species (1.02%).

Table 1: Avian species recorded during survey and eBird database (LC- Least Concern; VU-Vulnerable; NT-Near threatened; EN- Endangered; HB- Herbivorous; CR- Carnivorous; OM- Omnivorous; IN- Insectivorous; GR- Granivorous; NC- Nectarivore; PS- Piscivore; FR- Frugivorous)

S. No.	Common name	Scientific name	IUCN status	Feeding habit
Order Anseriformes: Family Anatidae				
1	Indian Spot-billed Duck	<i>Anas poecilorhyncha</i>	LC	HB
2	Ruddy Shelduck (Brahminy Duck)	<i>Tadorna ferruginea</i>	LC	OM
3	Eurasian Wigeon	<i>Mareca penelope</i>	LC	HB
4	Northern Shoveler	<i>Spatula clypeata</i>	LC	OM
5	Northern Pintail	<i>Anas acuta</i>	LC	OM
6	Green-winged Teal (Common Teal/ Eurasian teal)	<i>Anas crecca</i>	LC	OM
7	Lesser Whistling-Duck	<i>Dendrocygna javanica</i>	LC	OM
8	Bar-headed Goose	<i>Anser indicus</i>	LC	OM
9	Gadwall	<i>Mareca strepera</i>	LC	HB
10	Common Pochard	<i>Aythya ferina</i>	VU	OM
11	Garganey	<i>Spatula querquedula</i>	LC	OM
Order Galliformes: Family Phasianidae				
12	Indian Peafowl	<i>Pavo cristatus</i>	LC	OM
13	Grey Francolin	<i>Ortygornis pondicerianus</i>	LC	OM
14	Rock Bush-Quail	<i>Perdica argoondah</i>	LC	OM
15	Rain Quail	<i>Coturnix coromandelica</i>	LC	OM
16	Painted Francolin	<i>Francolinus pictus</i>	LC	OM
17	Jungle Bush-Quail	<i>Perdica asiatica</i>	LC	OM
Order Columbiformes: Family Columbidae				
18	Rock Pigeon (Blue Rock Pigeon)	<i>Columba livia</i>	LC	GR
19	Laughing Dove (Little Brown Dove)	<i>Spilopelia senegalensis</i>	LC	GR
20	Eurasian Collared-Dove	<i>Streptopelia decaocto</i>	LC	OM
21	Spotted Dove	<i>Spilopelia chinensis</i>	LC	GR
22	Red Collared-Dove (Red Turtle-Dove)	<i>Streptopelia tranquebarica</i>	LC	GR
Order Ciconiiformes: Family Ciconiidae				
23	Painted Stork	<i>Mycteria leucocephala</i>	LC	CR
24	Asian Woolly-necked Stork	<i>Ciconia episcopus</i>	NT	CR
25	Black Stork	<i>Ciconia nigra</i>	LC	CR
26	Asian Openbill	<i>Anastomus oscitans</i>	LC	CR
Order Cuculiformes: Family Cuculidae				
27	Asian Koel	<i>Eudynamys scolopaceus</i>	LC	HB
28	Greater Coucal	<i>Centropus sinensis</i>	LC	CR
29	Common Cuckoo	<i>Cuculus canorus</i>	LC	CR
30	Grey-bellied Cuckoo	<i>Cacomantis passerinus</i>	LC	IN

31	Common Hawk-Cuckoo	<i>Hierococcyx varius</i>	LC	OM
32	Pied Cuckoo (Jacobin Cuckoo)	<i>Clamator jacobinus</i>	LC	IN
Order Pteroclidiformes: Family Pteroclididae				
33	Chestnut-bellied Sandgrouse	<i>Pterocles exustus</i>	LC	HB
34	Painted Sandgrouse	<i>Pterocles indicus</i>	LC	GR
Order Caprimulgiformes: Family Caprimulgidae				
35	Indian Nightjar	<i>Caprimulgus asiaticus</i>	LC	OM
Family Apodidae				
36	Little Swift (Indian House Swift)	<i>Apus affinis</i>	LC	CR
37	Asian Palm Swift	<i>Cypsiurus balasiensis</i>	LC	IN
Order Gruiformes: Family Rallidae				
38	Eurasian Coot	<i>Fulica atra</i>	LC	OM
39	White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	LC	OM
40	Eurasian Moorhen/ Common moorhen	<i>Gallinula chloropus</i>	LC	OM
41	Brown Crake	<i>Zapornia akool</i>	LC	OM
42	Grey-headed Swampen (Purple Swampen)	<i>Porphyrio poliocephalus</i>	LC	OM
Order Charadriiformes: Family Charadriidae				
43	Red-wattled Lapwing	<i>Vanellus indicus</i>	LC	OM
44	Little Ringed Plover	<i>Charadrius dubius</i>	LC	OM
45	Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>	LC	IN
Family Glareolidae				
46	Indian Courser	<i>Cursorius coromandelicus</i>	LC	IN
Family Jacanidae				
47	Bronze-winged Jacana	<i>Metopidius indicus</i>	LC	OM
Family Laridae				
48	River Tern	<i>Sterna aurantia</i>	VU	CR
Family Recurvirostridae				
49	Black-winged Stilt	<i>Himantopus himantopus</i>	LC	IN
Family Scolopacidae				
50	Common Sandpiper	<i>Actitis hypoleucos</i>	LC	IN
51	Green Sandpiper	<i>Tringa ochropus</i>	LC	IN
52	Common Snipe	<i>Gallinago gallinago</i>	LC	IN
53	Wood Sandpiper	<i>Tringa glareola</i>	LC	IN
54	Temminck's Stint	<i>Calidris temminckii</i>	LC	IN
55	Common Greenshank	<i>Tringa nebularia</i>	LC	IN
56	Spotted Redshank	<i>Tringa erythropus</i>	LC	IN
Family Turnicidae				
57	Barred Buttonquail	<i>Turnix suscitator</i>	LC	GR

58	Indian Pond-Heron	<i>Ardeola grayii</i>	LC	CR
59	Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	LC	CR
60	Little Egret	<i>Egretta garzetta</i>	LC	CR
61	Great Egret	<i>Ardea alba</i>	LC	CR
62	Grey Heron	<i>Ardea cinerea</i>	LC	CR
63	Cattle Egret	<i>Bubulcus ibis</i>	LC	CR
64	Intermediate Egret	<i>Ardea intermedia</i>	LC	CR
65	Purple Heron	<i>Ardea purpurea</i>	LC	CR
Family Threskiornithidae				
66	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT	CR
67	Eurasian Spoonbill	<i>Platalea leucorodia</i>	LC	CR
68	Red-naped Ibis (Indian Black Ibis)	<i>Pseudibis papillosa</i>	LC	CR
69	Glossy Ibis	<i>Plegadis falcinellus</i>	LC	CR
Order Podicipediformes: Family Podicipedidae				
70	Little Grebe	<i>Tachybaptus ruficollis</i>	LC	CR
Order Suliformes: Family Phalacrocoracidae				
71	Little Cormorant	<i>Microcarbo niger</i>	LC	PS
72	Indian Cormorant (Indian Shag)	<i>Phalacrocorax fuscicollis</i>	LC	CR
73	Great Cormorant	<i>Phalacrocorax carbo</i>	LC	CR
Order Accipitriformes: Family Accipitridae				
74	Shikra	<i>Accipiter badius</i>	LC	CR
75	Bonelli's Eagle	<i>Aquila fasciata</i>	LC	CR
76	Black-winged Kite (Black-shouldered Kite)	<i>Elanus caeruleus</i>	LC	CR
77	White-eyed Buzzard	<i>Butastur teesa</i>	LC	CR
78	Steppe Eagle	<i>Aquila nipalensis</i>	EN	CR
79	Eurasian Sparrowhawk	<i>Accipiter nisus</i>	LC	CR
80	Montagu's Harrier	<i>Circus pygargus</i>	LC	CR
81	Pallid Harrier	<i>Circus macrourus</i>	NT	CR
82	Greater Spotted Eagle	<i>Clanga clanga</i>	VU	CR
83	Short-toed Snake-Eagle	<i>Circaetus gallicus</i>	LC	CR
84	Brahminy Kite	<i>Haliastur indus</i>	LC	CR
85	Black Kite	<i>Milvus migrans</i>	LC	CR
86	Oriental Honey-buzzard (Crested Honey Buzzard)	<i>Pernis ptilorhynchus</i>	LC	CR
87	Egyptian Vulture	<i>Neophron percnopterus</i>	EN	CR
88	Booted Eagle	<i>Hieraaetus pennatus</i>	LC	CR
89	Eurasian Marsh-Harrier	<i>Circus aeruginosus</i>	LC	CR
90	Tawny Eagle	<i>Aquila rapax</i>	VU	CR
Order Strigiformes: Family Tytonidae				
91	Barn Owl	<i>Tyto alba</i>	LC	CR

Family Strigidae				
92	Spotted Owlet	<i>Athene brama</i>	LC	CR
Order Bucerotiformes: Family Bucerotidae				
93	Indian Grey Hornbill	<i>Ocyrceros birostris</i>	LC	FR
Family Upupidae				
94	Eurasian Hoopoe	<i>Upupa epops</i>	LC	IN
Order Coraciiformes: Family Alcedinidae				
95	White-throated Kingfisher	<i>Halcyon smyrnensis</i>	LC	CR
96	Common Kingfisher (Small Blue Kingfisher)	<i>Alcedo atthis</i>	LC	CR
Family Coraciidae				
97	Indian Roller	<i>Coracias benghalensis</i>	LC	IN
98	European Roller	<i>Coracias garrulus</i>	LC	IN
Family Meropidae				
99	Asian Green Bee-eater	<i>Merops orientalis</i>	LC	IN
Order Piciformes: Family Megalaimidae				
100	Coppersmith Barbet	<i>Psilopogon haemacephalus</i>	LC	FR
Family Picidae				
101	Eurasian Wryneck	<i>Jynx torquilla</i>	LC	IN
Order Falconiformes: Family Falconidae				
102	Eurasian Kestrel (Common Kestrel)	<i>Falco tinnunculus</i>	LC	CR
103	Amur Falcon	<i>Falco amurensis</i>	LC	CR
104	Red-necked Falcon	<i>Falco chicquera</i>	NT	CR
Order Psittaciformes: Family Psittaculidae				
105	Alexandrine Parakeet	<i>Psittacula eupatria</i>	NT	FR
106	Rose-ringed Parakeet	<i>Psittacula krameri</i>	LC	FR
107	Plum-headed Parakeet	<i>Psittacula cyanocephala</i>	LC	FR
Order Passeriformes: Family Campephagidae				
108	Black-headed Cuckooshrike	<i>Lalage melanoptera</i>	LC	IN
109	Small Minivet	<i>Pericrocotus cinnamomeus</i>	LC	IN
110	White-bellied Minivet	<i>Pericrocotus erythropygius</i>	LC	IN
Family Oriolidae				
111	Indian Golden Oriole	<i>Oriolus kundoo</i>	LC	OM
Family Vangidae				
112	Common Woodshrike	<i>Tephrodornis pondicerianus</i>	LC	IN
Family Aegithinidae				
113	Common Iora	<i>Aegithina tiphia</i>	LC	IN
Family Rhipiduridae				
114	Spot-breasted Fantail (White-spotted Fantail)	<i>Rhipidura albogularis</i>	LC	IN

Family Dicruridae				
115	Black Drongo	<i>Dicrurus macrocercus</i>	LC	IN
116	Ashy Drongo	<i>Dicrurus leucophaeus</i>	LC	IN
Family Laniidae				
117	Long-tailed Shrike	<i>Lanius schach</i>	LC	IN
118	Great Grey Shrike	<i>Lanius excubitor</i>	LC	CR
119	Bay-backed Shrike	<i>Lanius vittatus</i>	LC	IN
120	Brown Shrike	<i>Lanius cristatus</i>	LC	IN
Family Fringillidae				
121	Common Rosefinch	<i>Carpodacus erythrinus</i>	LC	OM
Family Corvidae				
122	House Crow	<i>Corvus splendens</i>	LC	OM
123	Large-billed Crow	<i>Corvus macrorhynchos</i>	LC	OM
Family Paridae				
124	Cinereous Tit (Great Tit)	<i>Parus cinereus</i>	LC	IN
Family Sylviidae				
125	Lesser Whitethroat	<i>Curruca curruca</i>	LC	IN
126	Yellow-eyed Babbler	<i>Chrysomma sinense</i>	LC	IN
127	Eastern Orphean Warbler	<i>Curruca crassirostris</i>	LC	IN
Family Alaudidae				
128	Rufous-tailed Lark	<i>Ammomanes phoenicura</i>	LC	IN
129	Tawny Lark (Sykes's Lark)	<i>Galerida deva</i>	LC	OM
130	Malabar Lark	<i>Galerida malabarica</i>	LC	IN
131	Mongolian Short-toed Lark (Sykes's Short-toed Lark)	<i>Calandrella dukhunensis</i>	LC	OM
132	Indian Bushlark (Red-winged Bushlark)	<i>Mirafr erythroptera</i>	LC	IN
133	Ashy-crowned Sparrow-Lark (Ashy-crowned Finch-Lark)	<i>Eremopterix griseus</i>	LC	IN
Family Cisticolidae				
134	Ashy Prinia	<i>Prinia socialis</i>	LC	IN
135	Common Tailorbird	<i>Orthotomus sutorius</i>	LC	IN
136	Jungle Prinia	<i>Prinia sylvatica</i>	LC	IN
137	Rufous-fronted Prinia	<i>Prinia buchanani</i>	LC	IN
138	Plain Prinia	<i>Prinia inornata</i>	LC	IN
139	Grey-breasted Prinia	<i>Prinia hodgsonii</i>	LC	IN
140	Zitting Cisticola	<i>Cisticola juncidis</i>	LC	IN
Family Acrocephalidae				
141	Blyth's Reed Warbler	<i>Acrocephalus dumetorum</i>	LC	IN
142	Paddyfield Warbler	<i>Acrocephalus agricola</i>	LC	IN
143	Clamorous Reed Warbler (Indian Great Reed Warbler)	<i>Acrocephalus stentoreus</i>	LC	IN
144	Sykes's Warbler	<i>Iduna rama</i>	LC	IN
145	Booted Warbler	<i>Iduna caligata</i>	LC	IN

Family Hirundinidae				
146	Barn Swallow	<i>Hirundo rustica</i>	LC	IN
147	Wire-tailed Swallow	<i>Hirundo smithii</i>	LC	IN
148	Red-rumped Swallow	<i>Cecropis daurica</i>	LC	IN
149	Streak-throated Swallow	<i>Petrochelidon fluvicola</i>	LC	IN
150	Dusky Crag-Martin	<i>Ptyonoprogne concolor</i>	LC	IN
Family Pycnonotidae				
151	Red-vented Bulbul	<i>Pycnonotus cafer</i>	LC	FR
152	Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	LC	FR
Family Phylloscopidae				
153	Sulphur-bellied Warbler	<i>Phylloscopus griseolus</i>	LC	IN
154	Common Chiffchaff	<i>Phylloscopus collybita</i>	LC	IN
Family Zosteropidae				
155	Indian White-eye (Oriental White-eye)	<i>Zosterops palpebrosus</i>	LC	IN
Family Leiothrichidae				
156	Large Grey Babbler	<i>Argya malcolmi</i>	LC	IN
157	Jungle Babbler	<i>Argya striata</i>	LC	IN
158	Common Babbler	<i>Argya caudata</i>	LC	OM
Family Sturnidae				
159	Brahminy Starling	<i>Sturnia pagodarum</i>	LC	IN
160	Common Myna	<i>Acridotheres tristis</i>	LC	IN
161	Rosy Starling	<i>Pastor roseus</i>	LC	FR
162	Jungle Myna	<i>Acridotheres fuscus</i>	LC	OM
Family Muscipidae				
163	Siberian Stonechat	<i>Saxicola maurus</i>	LC	IN
164	Indian Robin	<i>Copsychus fulicatus</i>	LC	IN
165	Isabelline Wheatear	<i>Oenanthe isabellina</i>	LC	IN
166	Pied Bushchat	<i>Saxicola caprata</i>	LC	IN
167	Black Redstart	<i>Phoenicurus ochruros</i>	LC	IN
168	Oriental Magpie-Robin	<i>Copsychus saularis</i>	LC	IN
169	Red-breasted Flycatcher	<i>Ficedula parva</i>	LC	IN
170	Bluethroat	<i>Luscinia svecica</i>	LC	IN
171	Tickell's Blue Flycatcher	<i>Cyornis tickelliae</i>	LC	IN
172	Blue Rock-Thrush	<i>Monticola solitarius</i>	LC	IN
173	Desert Wheatear	<i>Oenanthe deserti</i>	LC	IN
174	Brown Rock Chat (Indian Chat)	<i>Oenanthe fusca</i>	LC	IN
Family Nectariniidae				
175	Purple Sunbird	<i>Cinnyris asiaticus</i>	LC	NC
176	Purple-rumped Sunbird	<i>Leptocoma zeylonica</i>	LC	NC
Family Ploceidae				

177	Baya Weaver	<i>Ploceus philippinus</i>	LC	OM
Family Emberizidae				
178	Grey-necked Bunting (Grey-hooded Bunting)	<i>Emberiza buchanani</i>	LC	GR
179	Striolated Bunting (House Bunting)	<i>Emberiza striolata</i>	LC	GR
180	Black-headed Bunting	<i>Emberiza melanocephala</i>	LC	OM
181	Red-headed Bunting	<i>Emberiza bruniceps</i>	LC	OM
182	Crested Bunting	<i>Emberiza lathami</i>	LC	OM
Family Estrildidae				
183	Scaly-breasted Munia (Spotted Munia)	<i>Lonchura punctulata</i>	LC	GR
184	Indian Silverbill (White-throated Munia)	<i>Euodice malabarica</i>	LC	GR
185	Red Avadavat	<i>Amandava amandava</i>	LC	GR
186	Tricolored Munia (Black-headed Munia)	<i>Lonchura malacca</i>	LC	GR
Family Passeridae				
187	House Sparrow	<i>Passer domesticus</i>	LC	GR
188	Yellow-throated Sparrow (Chestnut-shouldered Petronia)	<i>Gymnoris xanthocollis</i>	LC	GR
Family Motacillidae				
189	Tawny Pipit	<i>Anthus campestris</i>	LC	IN
190	Blyth's Pipit	<i>Anthus godlewskii</i>	LC	IN
191	Western Yellow Wagtail	<i>Motacilla flava</i>	LC	IN
192	Grey Wagtail	<i>Motacilla cinerea</i>	LC	IN
193	Paddyfield Pipit	<i>Anthus rufulus</i>	LC	IN
194	Tree Pipit	<i>Anthus trivialis</i>	LC	IN
195	White-browed Wagtail (Large Pied Wagtail)	<i>Motacilla maderaspatensis</i>	LC	IN
196	Long-billed Pipit	<i>Anthus similis</i>	NE	OM
197	White Wagtail	<i>Motacilla alba</i>	LC	IN

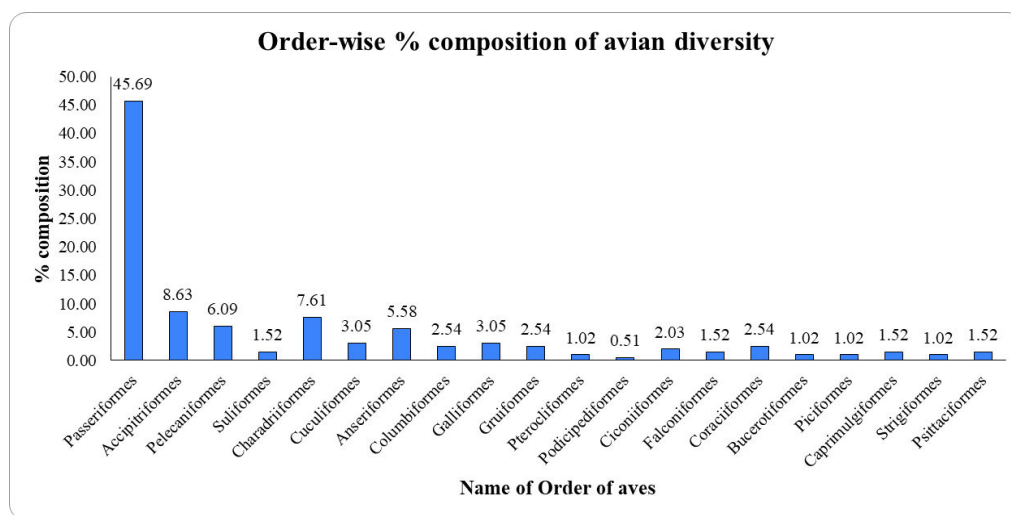


Fig. 2: Order-wise % composition of avian fauna of Morgaon village.

Table 2: Family-wise composition of reported species of birds

S. No.	Name of the family	No. of species	% composition
1	Accipitridae	17	8.63
2	Acrocephalidae	5	2.54
3	Aegithinidae	1	0.51
4	Alaudidae	6	3.05
5	Alcedinidae	2	1.02
6	Anatidae	11	5.58
7	Apodidae	2	1.02
8	Ardeidae	8	4.06
9	Bucerotidae	1	0.51
10	Campephagidae	3	1.52
11	Caprimulgidae	1	0.51
12	Charadriidae	3	1.52
13	Ciconiidae	4	2.03
14	Cisticolidae	7	3.55
15	Columbidae	5	2.54
16	Coraciidae	2	1.02
17	Corvidae	2	1.02
18	Cuculidae	6	3.05
19	Dicruridae	2	1.02
20	Emberizidae	5	2.54
21	Estrildidae	4	2.03
22	Falconidae	3	1.52
23	Fringillidae	1	0.51
24	Glareolidae	1	0.51
25	Hirundinidae	5	2.54
26	Jacaniidae	1	0.51
27	Laniidae	4	2.03
28	Laridae	1	0.51
29	Leiothrichidae	3	1.52
30	Megalaimidae	1	0.51
31	Meropidae	1	0.51
32	Motacillidae	9	4.57
33	Muscicapidae	12	6.09
34	Nectariniidae	2	1.02
35	Oriolidae	1	0.51
36	Paridae	1	0.51
37	Passeridae	2	1.02
38	Phalacrocoracidae	3	1.52
39	Phasianidae	6	3.05
40	Phylloscopidae	2	1.02
41	Picidae	1	0.51
42	Ploceidae	1	0.51
43	Podicipedidae	1	0.51
44	Psittaculidae	3	1.52
45	Pteroclididae	2	1.02
46	Pycnonotidae	2	1.02
47	Rallidae	5	2.54
48	Recurvirostridae	1	0.51
49	Rhipiduridae	1	0.51
50	Scolopacidae	7	3.55
51	Strigidae	1	0.51
52	Sturnidae	4	2.03
53	Sylviidae	3	1.52
54	Threskiornithidae	4	2.03
55	Turnicidae	1	0.51
56	Tytonidae	1	0.51
57	Upupidae	1	0.51
58	Vangidae	1	0.51
59	Zosteropidae	1	0.51

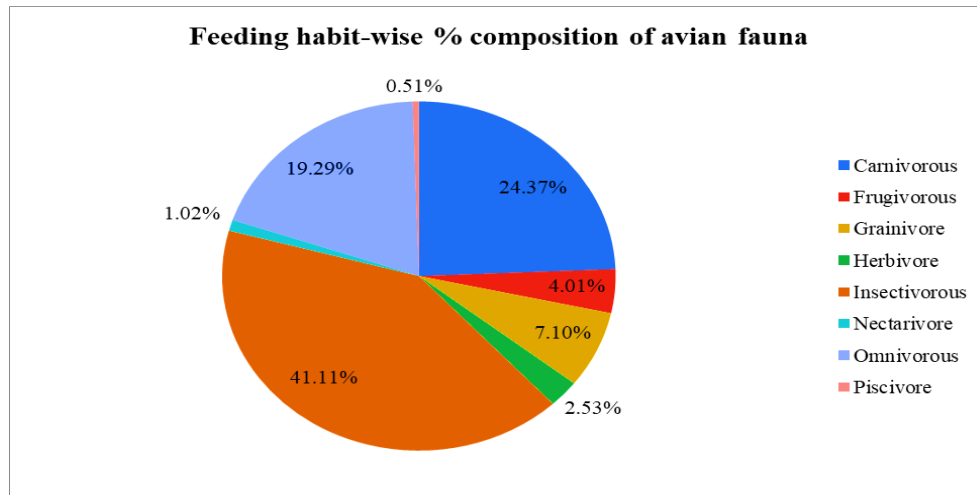


Fig. 3: Feeding habit-wise % composition of avian fauna of Morgaon village.

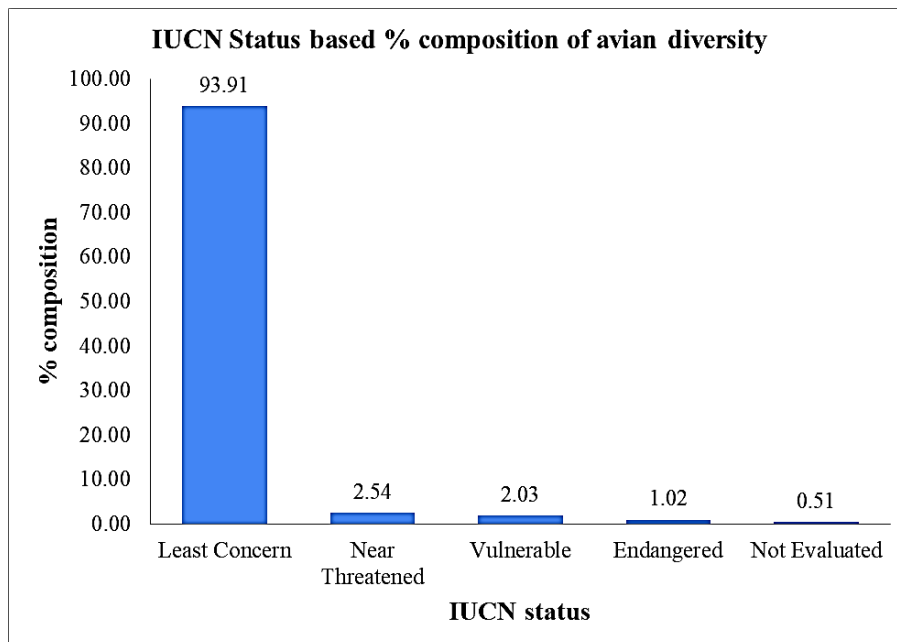


Fig. 4: IUCN status based % composition of avian fauna of Morgaon village.

The remaining families including Aegithinidae, Bucerotidae, Caprimulgidae, Fringillidae, Glareolidae, Jacanidae, Laridae, Megalaimidae, Oriolidae, Paridae, Picidae, Ploceidae, Podicipedidae, Recurvirostridae, Rhipiduridae, Strigidae, Turnicidae, Tytonidae, Upupidae, Vangidae and Zosteropidae representing only one species with 0.51% contribution (Table 2).

The feeding habit studies revealed that among 197 species, 81 species (41.12%) are Insectivorous; 48 species (24.37%) are Carnivorous; 38 species (19.29%) are Omnivorous; Frugivorous

with 8 species (4.06%); Herbivore with 5 species (2.54%); Nectarivore with 2 species (1.02%) and Piscivore with one species (0.51%) (Table 1; Fig. 3).

The IUCN conservation status of birds revealed that 185 species (93.91%) are listed as a "Least Concern" followed by 5 species from "Near Threatened" contributing about 2.54%, 4 species from "Vulnerable" contributing about 2.03%, 2 species from "Endangered" contributing about 1.02% and 1 species (0.51%) which was not evaluated. Among 197 species, four vulnerable

species namely River Tern *Sterna aurantia*, Greater Spotted Eagle *Clanga clanga*, Common Pochard *Aythya ferina* and Tawny Eagle *Aquila rapax*; two endangered species namely Steppe Eagle *Aquila nipalensis* and Egyptian Vulture *Neophron percnopterus*, and five near-threatened species namely Black-headed Ibis *Threskiornis melanocephalus*, Pallid Harrier *Circus macrourus*, Asian Woolly-necked Stork *Ciconia episcopus*, Alexandrine Parakeet *Psittacula eupatria* and Red-necked Falcon *Falco chicquera* were found at the study area. The Long-billed Pipit *Anthus similis* is in criterion of "Not Evaluated" (Table 1; Fig. 4).

Discussion

There are very less reports available on avian fauna Pune district of Maharashtra. The urban and semi-urban areas in and around Pune city of Maharashtra reported a total of 50 avian species with the highest number from the order Passeriformes. The same report also showed the occurrence of two nearly-threatened species namely *Threskiornis melanocephalus* and *Ciconia episcopus* and one vulnerable species namely *Sterna aurantia* (Chawan *et al.*, 2023). The wetlands from the Pune district of Maharashtra namely Khadakwasla Reservoir, Kawadi and Pashan Lake showed a total of 177 bird species belonging to 64 families and 133 genera. The highest number was from Kawadi Lake which showed a total of 59 species as compared to Pashan Lake with 50 species and Khadakwasla Dam with 43 species. The same report also noticed the occurrence of four nearly-threatened species namely *Aythya ferina*, *Mycteria leucocephala*, *Threskiornis melanocephalus*, *Anhinga melanogaster* (Koparde and Raote, 2016).

A study on bird diversity of the campus of Savitribai Phule Pune University, Pune, and Khadaki Lake showed the presence of 56 species at the current time and also indicates the decline of 34 species from the same study area. The increase in human settlement in the surrounding region of the campus also could be the reason for the decline (Choudaj and Wankhade, 2021). From the campus of Tuljaram Chaturchand College,

Baramati of Maharashtra, a total of 24 bird species from 7 orders and 15 families has been reported. The highest number was from the Order Passeriformes (Nale, 2023). Similar results are also found in present investigation. The order Passeriformes was dominant with 27 families and 90 species. Also maximum number of birds was from insectivorous insects. The rich diversity of birds indicates need of more attention towards bird conservation.

Conclusion

This study revealed a total of 197 avian species from from Morgaon village, Pune district of Maharashtra which indicates that it is rich in diversity. The avian diversity of the study area will be more than currently listed as the time span taken into consideration is of five year in this work. It is recommended that the government, organizations working for conservation, and academics should make more systematic efforts that are needed to monitor avian diversity, distribution, behavior, and conservation needs in a real-time manner. Regulations on anthropogenic activities in the study area are required along with the provision of water in the different aquatic bodies of the study area to increase the diversity of bird species. The study is significant for future research and will aid in the conservation strategies of the species found in the study area.

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