

Preliminary Survey on Relative Diversity and Residential Status of Avifauna in district Karnal, Haryana (India).

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Abstract

The present study was conducted in different sites of district Karnal, Haryana (India) from May 2017 to April 2019. A total of 122 bird species were observed by using line and point count method. These 122 bird species belongs to 17 different orders and maximum bird species were observed in order Passeriformes (48) followed by order Pelecaniformes (14). Accipitridae and Ardeidae were two families in which equal number of bird species (8) were observed. A total of 88 bird species out of 122 observed avian species were resident, 29 bird species were winter migrants and 5 bird species were observed only in summer during the present study. Further out of 122 bird species, 118 bird species belongs to IUCN Least Concern category, 2 bird species belongs to near threatened category, one bird species belongs to Endangered category and one bird species belongs to vulnerable category. Motacillidae was the largest family in order Passeriformes and forms 5.73% (RDi value) of the total species recorded during the entire study period. Maximum value of 6.55% (RDi value) were observed in two families Accipitridae and Ardeidae.

Keywords: *Relative Diversity, Vulnerable, Endangered, Point Count.*

1. Introduction

Biological resources are the basis of life in the tropical world. Biodiversity is the total variety of life on earth (Rajendran *et al.*, 2014). It includes micro-organism, plant and animal wildlife and the water, land and air in which they live and interact. It is natural biological capita of the earth. Biodiversity plays important environmental and developmental role which are very crucial to human survival but are not according to economic value (Khan, 1998). Birds and their diversity constitute a main part of the natural environment and play a functional role as agents of flower pollination, seed dispersal, source of food chain and agents in breaking seed dormancy (Nason, 1992). Birds also act as dispersal agents in

transferring nutrients and spores from one place to another during their migration and local movements (Niemi, 1985). Birds show variations greatly in their diversity, habitats, abundance and distribution throughout the globe. They have usually more diversity in tropics than others regions like temperate, alpine or polar. Their habitat preferences are more or less specialized. They occupy higher trophic levels in food webs. They also vary in their abundance because some species occur in large numbers while others are represented by few individuals only. Some avian species have small breeding ranges in some particular region whereas others travel long distance and annual migrations throughout the globe. Their distribution reflects many other wildlife groups (Karr, 1976).

2. Review of Literature

A lot of work has been done on avian diversity in India and other parts of world. Khan (1980) studied the avifauna of the sholas and the neighboring plantation in the Nilgiris. Sugathan (1982) studied the avifauna of the Point Calimere Sanctuary, Thanjavur, Tamil Nadu. Kalsi (1998) studied the avian diversity of Kalesar wildlife sanctuary. A total of 161 species were observed including 112 resident species and 49 migrant species. Kumar and Gupta (2009) studied the diversity and abundance of wetland birds around Kurukshetra, India. They reported a total of 54 species of wetland birds belonging to 5 orders, 15 families. Khan and Pant (2016) studied the conservation status, species composition, and distribution of avian community in Bhimbandh wildlife sanctuary, India. Praveen *et al.* (2016) classify and enlisted the birds of Indian sub-continent into 23 orders, 107 families and 498 genera representing the world avian diversity by about 64%, 45% and 21% respectively. Simon and Okoth (2016) studied the species richness and abundance of birds in and around Nimule national park, South Sudan. A

total of 211 species from 20 orders and 64 families were observed during their investigation.

3. Materials and Methods

Karnal is one of the famous city in Haryana located on National Highway number 44. The Name Karnal is derived from famous character Karan in epic Mahabharata. The whole area around Karnal including Taraori is famous for the production of rice and number of famous research institute like N.D.R.I. are located in this historical city. The present study on avian diversity was conducted from May 2017 to April 2019 at selected sites in district Karnal. Regular visits were made during the present study at these selected sites. Observations were conducted during morning (06:00 to 10:00 hrs) and evening (15:00 to 18:00 hrs) to record avian species by using line transects and point count method (Singh, 1995) in selected sites. Observations were also made during the noon and afternoon hours. The birds were observed with 8x42 Nikon binoculars and for photography digital and DSLR camera were used. Universal accepted handbooks and field guides were used for identification and taxonomy of birds (Ali and Ripley, 1987; Grimmet *et al.*, 1998). The checklist of avifauna was prepared using standard common and scientific names of the birds following Manakadan and Pittie, 2001 & Praveen *et al.*, 2016. The residential status of the observed avian species was assigned into three categories, Resident, Species recorded throughout the year in the study area; Winter Migratory (WM), Species recorded only during winter season and Summer Migratory (SM), Species recorded only during summer season based upon the presence or absence method following (Ali and Ripley, 1987), Mackinnon and Phillip (1993), Grimmet *et al.* (1998) and Inskipp *et al.* (1999). The conservation status of the bird species was assessed according to the IUCN database. The relative diversity (RD_i) of families was calculated using the following formula (Torre-Cuadros *et al.*, 2007):

$$RD_i = \frac{\text{Number of bird species in a family}}{\text{Total number of bird species observed}} \times 100$$

4. Results and Discussion

During the present study a total of 122 avian species belonging to 87 genera and 45 families were observed at different sites of district Karnal, Haryana. A checklist of recorded avian species along with their taxonomy, residential status and

conservation status is given in Table 1.1. During the study period, 17 different orders of birds were observed. Out of these 17 order, maximum number of bird species were observed in order Passeriformes (S=48) followed by order Pelecaniformes (S=14); Charadriiformes (S=10); Accipitriformes (S=8); Anseriformes (S=6); Columbiformes (S=6); Coraciiformes (S=5); Cuculiformes (S=5); Galliformes (S=4); Piciformes (S=3); Psittaciformes (S=2); Bucerotiformes (S=2); Strigiformes (S=2); Gruiformes (S=2); Falconiformes (S=2); Caprimulgiformes (S=1) and Phoenicopteriformes (S=1). As far as number of bird species was considered familywise, it was found that maximum number of bird species were observed in two families Ardeidae (8) and Accipitridae (8). It was great success of this study that Alpine swift who was normally distributed in the Himalayan region was observed once around Bakhra canal near Taraori. Results related to residential status of the observed avian fauna revealed that a total of 88 bird species out of 122 observed avian species were resident, whereas 29 bird species were winter migrants. Only 5 bird species were observed only in summer during the present study. It was observed during the present study that out of 122 bird species, 118 bird species belongs to IUCN Least Concern category; 2 bird species i.e., Painted Stork, *Mycteria leucocephala* and Black-headed Ibis, *Threskiornis melanocephalus* (Pelecaniformes) belongs to near threatened category, one bird species Egyptian Vulture, *Neophron percnopterus* (Accipitriformes) belongs to Endangered category and one bird species Common Pochard, *Aythya ferina* (Anseriformes) belongs to vulnerable category. Order Passeriformes was represented by 19 families and maximum number of bird species were observed in family Motacillidae at different sites and these forms 5.73% (RD_i value) of the total species recorded during the entire study period. Maximum value of 6.55% (RD_i value) were observed in two families Accipitridae and Ardeidae. During present a number of stress factors like spreading of urbanization and commercial use of village ponds were found to be responsible for the deterioration and disturbance of natural habitat of avian species. Extensive survey and investigations must be planned in this area to determine the biodiversity of bird species in near future.

Table.1 Checklist of Avian fauna recorded in district Karnal, Haryana.

Sr. No	Common Name	Scientific Name	Order	Family	Residential Status	IUCN Status
1	Brown Rock Chat	<i>Oenanthe fusca</i> (Blyth, 1851)	Passeriformes	Muscicapidae	R	LC 3.1 version
2	Pied Bushchat	<i>Saxicola caprata</i> (Linnaeus, 1766)	Passeriformes	Muscicapidae	R	LC 3.1 version
3	Common Stone Chat	<i>Saxicola torquata</i> (Pallas, 1773)	Passeriformes	Muscicapidae	WM	LC 3.1 version
4	Indian Robin	<i>Saxicoloides fulicatus</i> (Linnaeus, 1766)	Passeriformes	Muscicapidae	R	LC 3.1 version
5	Oriental Magpie Robin	<i>Copsychus saularis</i> (Linnaeus, 1758)	Passeriformes	Muscicapidae	R	LC 3.1 version
6	Grey wagtail	<i>Motacilla cinerea</i> Tunstall, 1771	Passeriformes	Motacillidae	WM	LC 3.1 version
7	White-browed Wagtail	<i>Motacilla maderaspatensis</i> J.F. Gmelin, 1789	Passeriformes	Motacillidae	R	LC 3.1 version
8	White Wagtail	<i>Motacilla alba</i> Linnaeus, 1758	Passeriformes	Motacillidae	WM	LC 3.1 version
9	Western Yellow Wagtail	<i>Motacilla flava</i> Linnaeus, 1758	Passeriformes	Motacillidae	WM	LC 3.1 version
10	Rosy Pipit	<i>Anthus roseatus</i> Blyth, 1847	Passeriformes	Motacillidae	WM	LC 3.1 version
11	Paddy-field Pipit	<i>Anthus rufulus</i> Vieillot, 1818	Passeriformes	Motacillidae	R	LC 3.1 version
12	Long-billed Pipit	<i>Anthus similis</i> (Jerdon, 1840)	Passeriformes	Motacillidae	WM	LC 3.1 version
13	Common Myna	<i>Acridotheres tristis</i> (Linnaeus, 1766)	Passeriformes	Sturnidae	R	LC 3.1 version
14	Bank Myna	<i>Acridotheres ginginianus</i> (Latham, 1790)	Passeriformes	Sturnidae	R	LC 3.1 version
15	Brahminy Starling	<i>Sturnia pagodarum</i> (J.F. Gmelin, 1789)	Passeriformes	Sturnidae	R	LC 3.1 version
16	Asian Pied Starling	<i>Gracupica contra</i> (Linnaeus, 1758)	Passeriformes	Sturnidae	R	LC 3.1 version
17	Common Tailorbird	<i>Orthotomus sutorius</i> (Pennant, 1769)	Passeriformes	Cisticolidae	R	LC 3.1 version
18	Striated Prinia	<i>Prinia crinigera</i> Hodgson, 1836	Passeriformes	Cisticolidae	R	LC 3.1 version
19	Plain Prinia	<i>Prinia inornata</i> Sykes, 1832	Passeriformes	Cisticolidae	R	LC 3.1 version
20	Rufous-fronted Prinia	<i>Prinia buchanani</i> Blyth, 1844	Passeriformes	Cisticolidae	R	LC 3.1 version
21	Ashy Prinia	<i>Prinia socialis</i> Sykes, 1832	Passeriformes	Cisticolidae	R	LC 3.1 version
22	Graceful Prinia	<i>Prinia gracilis</i> (M.H.C. Lichtenstein, 1823)	Passeriformes	Cisticolidae	R	LC 3.1 version
23	House Crow	<i>Corvus splendens</i> Vieillot, 1817	Passeriformes	Corvidae	R	LC 3.1 version
24	Rufous Treepie	<i>Dendrocitta vagabunda</i> (Latham, 1790)	Passeriformes	Corvidae	R	LC 3.1 version
	Red -vented	<i>Pycnonotus cafer</i>	Passeriformes	Pycnonotidae	R	LC 3.1

25	Bulbul	(Linnaeus, 1766)				version
26	Black Drongo	<i>Dicrurus macrocercus</i> Vieillot, 1817	Passeriformes	Dicruridae	R	LC 3.1 version
27	Ashy Drongo	<i>Dicrurus leucophaeus</i> Vieillot, 1817	Passeriformes	Dicruridae	WM	LC 3.1 version
28	Small Minivet	<i>Pericrocotus cinnamomeus</i> (Linnaeus, 1766)	Passeriformes	Campephagidae	WM	LC 3.1 version
29	Long-tailed Shrike	<i>Lanius schach</i> Linnaeus, 1758	Passeriformes	Laniidae	R	LC 3.1 version
30	Bay-backed Shrike	<i>Lanius vittatus</i> Valenciennes, 1826	Passeriformes	Laniidae	R	LC 3.1 version
31	Brown Shrike	<i>Lanius cristatus</i> Linnaeus, 1758	Passeriformes	Laniidae	WM	LC 3.1 version
32	Eurasian Golden Oriole	<i>Oriolus oriolus</i> (Linnaeus, 1758)	Passeriformes	Oriolidae	SM	LC 3.1 version
33	Indian Paradise- flycatcher	<i>Terpsiphone paradise</i> (Linnaeus, 1758)	Passeriformes	Monarchidae	WM	LC 3.1 version
34	Large Grey Babbler	<i>Turdoides malcolmi</i> (Sykes, 1832)	Passeriformes	Leiothrichidae	R	LC 3.1 version
35	Indian Silverbill	<i>Euodice malabarica</i> (Linnaeus, 1758)	Passeriformes	Estrildidae	R	LC 3.1 version
36	Scaly- breasted Munia	<i>Lonchura punctulata</i> (Linnaeus, 1758)	Passeriformes	Estrildidae	R	LC 3.1 version
37	Purple Sunbird	<i>Cinnyris asiaticus</i> (Latham, 1790)	Passeriformes	Nectariniidae	R	LC 3.1 version
38	House sparrow	<i>Passer domesticus</i> (Linnaeus, 1758)	Passeriformes	Passeridae	R	LC 3.1 version
39	Yellow-eyed Babbler	<i>Chrysomma sinense</i> (J.F. Gmelin, 1789)	Passeriformes	Sylviidae	R	LC 3.1 version
40	Barn Swallow	<i>Hirundo rustica</i> Linnaeus, 1758	Passeriformes	Hirundinidae	WM	LC 3.1 version
41	Wire-tailed Swallow	<i>Hirundo smithii</i> Leach, 1818	Passeriformes	Hirundinidae	R	LC 3.1 version
42	Sand Martin	<i>Riparia riparia</i> (Linnaeus, 1758)	Passeriformes	Hirundinidae	R	LC 3.1 version
43	Pale Martin	<i>Riparia diliuta</i> (Sharpe and Wyatt, 1893)	Passeriformes	Hirundinidae	WM	LC 3.1 version
44	Plain Martin	<i>Riparia paludicola</i> (Vieillot, 1817)	Passeriformes	Hirundinidae	R	LC 3.1 version
45	Black-breasted Weaver	<i>Ploceus benghalensis</i> (Linnaeus, 1758)	Passeriformes	Ploceidae	R	LC 3.1 version
46	Indian Bushlark	<i>Mirafra erythroptera</i> Blyth, 1845	Passeriformes	Alaudidae	R	LC 3.1 version
47	Sand Lark	<i>Alaudala raytal</i> (Blyth, 1845)	Passeriformes	Alaudidae	R	LC 3.1 version
48	Crested Lark	<i>Galerida cristata</i> (Linnaeus, 1758)	Passeriformes	Alaudidae	R	LC 3.1 version
49	Great Egret	<i>Ardea alba</i> Linnaeus, 1758	Pelecaniformes	Ardeidae	R	LC 3.1 version
50	Intermediate Egret	<i>Ardea intermedia</i> Wagler, 1829	Pelecaniformes	Ardeidae	R	LC 3.1 version
51	Grey Heron	<i>Ardea cinerea</i> Linnaeus, 1758	Pelecaniformes	Ardeidae	R	LC 3.1 version
52	Indian Pond	<i>Ardea grayii</i>	Pelecaniformes	Ardeidae	R	LC 3.1

	Heron	(Sykes, 1832)				version
53	Purple Heron	<i>Ardea purpurea</i> Linnaeus, 1766	Pelecaniformes	Ardeidae	R	LC 3.1 version
54	Little Egret	<i>Egretta garzetta</i> (Linnaeus, 1766)	Pelecaniformes	Ardeidae	R	LC 3.1 version
55	Cattle Egret	<i>Bubulcus ibis</i> (Linnaeus, 1758)	Pelecaniformes	Ardeidae	R	LC 3.1 version
56	Black-crowned Night Heron	<i>Nycticorax nycticorax</i> (Linnaeus, 1758)	Pelecaniformes	Ardeidae	R	LC 3.1 version
57	Painted Stork	<i>Mycteria leucocephala</i> (Pennant, 1769)	Pelecaniformes	Ciconiidae	R	NT 3.1 version
58	Asian Openbill	<i>Anastomus oscitans</i> (Boddaert, 1783)	Pelecaniformes	Ciconiidae	R	LC 3.1 version
59	Little Cormorant	<i>Microcarbo niger</i> (Vieillot, 1817)	Pelecaniformes	Phalacrocoracidae	R	LC 3.1 version
60	Great Cormorant	<i>Phalacrocorax carbo</i> (Linnaeus, 1758)	Pelecaniformes	Phalacrocoracidae	R	LC 3.1 version
61	Black-headed Ibis	<i>Threskiornis melanocephalus</i> (Latham, 1790)	Pelecaniformes	Threskiornithidae	SM	NT 3.1 version
62	Indian Black Ibis	<i>Pseudibis papillosa</i> (Temminck, 1824)	Pelecaniformes	Threskiornithidae	R	LC 3.1 version
63	Black Kite	<i>Milvus migrans</i> (Boddaert, 1783)	Accipitriformes	Accipitridae	R	LC 3.1 version
64	Brahminy Kite	<i>Haliastur indus</i> (Boddaert, 1783)	Accipitriformes	Accipitridae	R	LC 3.1 version
65	Black-winged Kite	<i>Elanus caeruleus</i> (Desfontaines, 1789)	Accipitriformes	Accipitridae	R	LC 3.1 version
66	Eurasian Sparrowhawk	<i>Accipiter nisus</i> (Linnaeus, 1758)	Accipitriformes	Accipitridae	WM	LC 3.1 version
67	Shikra	<i>Accipiter badius</i> (J.F. Gmelin, 1788)	Accipitriformes	Accipitridae	R	LC 3.1 version
68	Common Buzzard	<i>Buteo buteo</i> (Linnaeus, 1758)	Accipitriformes	Accipitridae	WM	LC 3.1 version
69	Long-legged Buzzard	<i>Buteo rufinus</i> (Cretzschmar, 1829)	Accipitriformes	Accipitridae	WM	LC 3.1 version
70	Egyptian Vulture	<i>Neophron percnopterus</i> (Linnaeus, 1758)	Accipitriformes	Accipitridae	WM	EN 3.1 version
71	Lesser Kestrel	<i>Falco naumanni</i> Fleischer, 1818	Falconiformes	Falconidae	WM	LC 3.1 version
72	Common Kestrel	<i>Falco tinnunculus</i> Linnaeus, 1758	Falconiformes	Falconidae	WM	LC 3.1 version
73	Green Bee-eater	<i>Merops orientalis</i> Latham, 1801	Coraciiformes	Meropidae	R	LC 3.1 version
74	Pied Kingfisher	<i>Ceryle rudis</i> (Linnaeus, 1758)	Coraciiformes	Alcedinidae	R	LC 3.1 version
75	White-throated Kingfisher	<i>Halcyon smyrnensis</i> (Linnaeus, 1758)	Coraciiformes	Alcedinidae	R	LC 3.1 version
76	Common Kingfisher	<i>Alcedo atthis</i> (Linnaeus, 1758)	Coraciiformes	Alcedinidae	R	LC 3.1 version
77	Indian Roller	<i>Coracias benghalensis</i> (Linnaeus, 1758)	Coraciiformes	Coraciidae	R	LC 3.1 version
78	Yellow-legged Green Pigeon	<i>Treron phoenicopterus</i> (Latham, 1790)	Colu mb iformes	Colu mb idae	R	LC 3.1 version

79	Rock Pigeon	<i>Columba livia</i> J.F. Gmelin, 1789	Columbiformes	Columbidae	R	LC 3.1 version
80	Oriental Turtle Dove	<i>Streptopelia orientalis</i> (Latham, 1790)	Columbiformes	Columbidae	R	LC 3.1 version
81	Spotted Dove	<i>Streptopelia chinensis</i> (Scopoli, 1786)	Columbiformes	Columbidae	R	LC 3.1 version
82	Eurasian Collared Dove	<i>Streptopelia decaocto</i> (Frisvaldszky, 1838)	Columbiformes	Columbidae	R	LC 3.1 version
83	Laughing Dove	<i>Streptopelia senegalensis</i> (Linnaeus, 1766)	Columbiformes	Columbidae	R	LC 3.1 version
84	Yellow-wattled Lapwing	<i>Vanellus malabarius</i> (Boddaert, 1783)	Charadriiformes	Charadriidae	R	LC 3.1 version
85	Red-wattled Lapwing	<i>Vanellus indicus</i> (Boddaert, 1783)	Charadriiformes	Charadriidae	R	LC 3.1 version
86	Green Sandpiper	<i>Tringa ochropus</i> Linnaeus, 1758	Charadriiformes	Scolopacidae	WM	LC 3.1 version
87	Marsh Sandpiper	<i>Tringa stagnatilis</i> (Bechstein, 1803)	Charadriiformes	Scolopacidae	WM	LC 3.1 version
88	Wood Sandpiper	<i>Tringa glareola</i> Linnaeus, 1758	Charadriiformes	Scolopacidae	WM	LC 3.1 version
89	Common Redshank	<i>Tringa tetanus</i> (Linnaeus, 1758)	Charadriiformes	Scolopacidae	WM	LC 3.1 version
90	Common Greenshank	<i>Tringa nebularia</i> (Gunnerus, 1767)	Charadriiformes	Scolopacidae	WM	LC 3.1 version
91	Eurasian Thick-knee	<i>Burhinus oedipnemos</i> (Linnaeus, 1758)	Charadriiformes	Burhinidae	R	LC 3.1 version
92	Pied Avocet	<i>Recurvirostra avosetta</i> Linnaeus, 1758	Charadriiformes	Recurvirostridae	WM	LC 3.1 version
93	Black-winged Stilt	<i>Himantopus himantopus</i> (Linnaeus, 1758)	Charadriiformes	Recurvirostridae	R	LC 3.1 version
94	Lesser Golden-backed Woodpecker	<i>Dinopium benghalense</i> (Linnaeus, 1758)	Piciformes	Picidae	R	LC 3.1 version
95	Brown-headed Barbet	<i>Psilopogon zeylanicus</i> (J.F. Gmelin, 1758)	Piciformes	Ramphastidae	R	LC 3.1 version
96	Coppersmith Barbet	<i>Psilopogon haemacephalus</i> (Statius Muller, 1766)	Piciformes	Ramphastidae	R	LC 3.1 version
97	Drongo Cuckoo	<i>Surniculus lugubris</i> (Horsfield, 1821)	Cuculiformes	Cuculidae	SM	LC 3.1 version
98	Asian Koel	<i>Eudynamis scolopacea</i> (Linnaeus, 1758)	Cuculiformes	Cuculidae	R	LC 3.1 version
99	Indian Cuckoo	<i>Cuculus micropterus</i> Gould, 1838	Cuculiformes	Cuculidae	SM	LC 3.1 version
100	Pied Cuckoo	<i>Clamator jacobinus</i> (Boddaert, 1783)	Cuculiformes	Cuculidae	SM	LC 3.1 version
101	Greater Coucal	<i>Centropus sinensis</i> (Stephens, 1815)	Cuculiformes	Cuculidae	R	LC 3.1 version
102	Rose-ringed Parakeet	<i>Psittacula krameri</i> (Scopoli, 1769)	Psittaciformes	Psittaculidae	R	LC 3.1 version
103	Alexandrine Parakeet	<i>Psittacula eupatria</i> (Linnaeus, 1766)	Psittaciformes	Psittaculidae	R	LC 3.1 version
104	Oriental Pied Hornbill	<i>Anthracoceros albirostris</i>	Bucerotiformes	Bucerotidae	R	LC 3.1 version

		(Shaw, 1808)				
105	Indian Grey Hornbill	<i>Ocyrceros birostris</i> (Scopoli, 1786)	Bucerotiformes	Bucerotidae	R	LC 3.1 version
106	Common Hoopoe	<i>Upupa epops</i> Linnaeus, 1758	Bucerotiformes	Upupidae	R	LC 3.1 version
107	Indian Peafowl	<i>Pavo cristatus</i> Linnaeus, 1758	Galliformes	Phasianidae	R	LC 3.1 version
108	Common Quail	<i>Coturnix coturnix</i> (Linnaeus, 1758)	Galliformes	Phasianidae	R	LC 3.1 version
109	Black Francolin	<i>Francolinus francolinus</i> (Linnaeus, 1766)	Galliformes	Phasianidae	R	LC 3.1 version
110	Grey Francolin	<i>Francolinus pondicerianus</i> (J.F. Gmelin, 1789)	Galliformes	Phasianidae	R	LC 3.1 version
111	Spotted Owlet	<i>Athene brama</i> (Temminck, 1821)	Strigiformes	Strigidae	R	LC 3.1 version
112	Common Barn Owl	<i>Tyto alba</i> (Scopoli, 1769)	Strigiformes	Strigidae	R	LC 3.1 version
113	White-breasted Waterhen	<i>Amaurornis phoenicurus</i> (Pennant, 1769)	Gruiformes	Rallidae	R	LC 3.1 version
114	Purple Swamphen	<i>Porphyrio porphyrio</i> (Linnaeus, 1758)	Gruiformes	Rallidae	R	LC 3.1 version
115	Indian Spot-billed Duck	<i>Anas poecilorhyncha</i> J.R. Forster, 1781	Anseriformes	Anatidae	R	LC 3.1 version
116	Common Pochard	<i>Aythya ferina</i> (Linnaeus, 1758)	Anseriformes	Anatidae	WM	VL 3.1 version
117	Ruddy Shelduck	<i>Tadorna ferruginea</i> (Pallas, 1764)	Anseriformes	Anatidae	WM	LC 3.1 version
118	Mallard	<i>Anas platyrhynchos</i> Linnaeus, 1758	Anseriformes	Anatidae	WM	LC 3.1 version
119	Northern Shoveller	<i>Spatula clypeata</i> (Linnaeus, 1758)	Anseriformes	Anatidae	WM	LC 3.1 version
120	Northern Pintail	<i>Anas acuta</i> Linnaeus, 1758	Anseriformes	Anatidae	WM	LC 3.1 version
121	Little Grebe	<i>Tachybaptus ruficollis</i> (Pallas, 1764)	Phoenicopteriformes	Podicipedidae	R	LC 3.1 version
122	Alpine Swift	<i>Tachymarptis melba</i> (Linnaeus, 1758)	Caprimulgiformes	Apodidae	SM	LC 3.1 version

Table 2. RDi value per family of observed avian fauna.

S. No.	Order	% Occurrence	Family	RDi Value
1	Passeriformes (48)	39.34	Muscicapidae (5)	4.09
			Motacillidae (7)	5.73
			Cisticolidae (6)	4.91
			Hirundinidae (5)	4.09
			Sturnidae (4)	3.27
			Corvidae (2)	1.63
			Dicruridae (2)	1.63
			Pycnonotidae (1)	.81
			Laniidae (3)	2.45
			Campephagidae (1)	.81
			Oriolidae (1)	.81
			Alaudidae (3)	2.45
			Monarchidae (1)	.81
			Leiothrichidae (1)	.81
			Estrildidae (2)	1.63
			Nectariniidae (1)	.81
			Passeridae (1)	.81
Sylviidae (1)	.81			
Ploceidae (1)	.81			
2	Pelecaniformes (14)	11.47	Ardeidae (8)	6.55
			Ciconiidae (2)	1.63
			Phalacrocoracidae (2)	1.63
			Threskiornithidae (2)	1.63
3	Charadriiformes (10)	8.19	Scolopacidae (5)	4.09
			Charadriidae (2)	1.63
			Recurvirostridae (2)	1.63
			Burhinidae (1)	.81
4	Accipitriformes (8)	6.55	Accipitridae (8)	6.55
5	Columbiformes (6)	6.55	Columbidae (6)	4.91
6	Anseriformes (6)	6.55	Anatidae (6)	4.91
7	Coraciiformes (5)	4.09	Alcedinidae (3)	2.45
			Meropidae (1)	.81
			Coraciidae (1)	.81
8	Cuculiformes (5)	4.09	Cuculidae (5)	4.09
9	Galliformes (4)	3.27	Phasianidae (4)	3.27
10	Piciformes (3)	2.45	Picidae (1)	.81
			Ramphastidae (2)	1.61
11	Bucerotiformes (3)	2.45	Bucerotidae (2)	1.61
			Upupidae (1)	.81
12	Psittaciformes (2)	1.61	Psittaculidae (2)	1.61
13	Strigiformes (2)	1.61	Strigidae (2)	1.61
14	Gruiformes (2)	1.61	Rallidae (2)	1.61
15	Falconiformes (2)	1.61	Falconidae (2)	1.61
16	Phoenicopteriformes (1)	.81	Podicipedidae (1)	.81
17	Caprimulgiformes (1)	.81	Apodidae (1)	.81

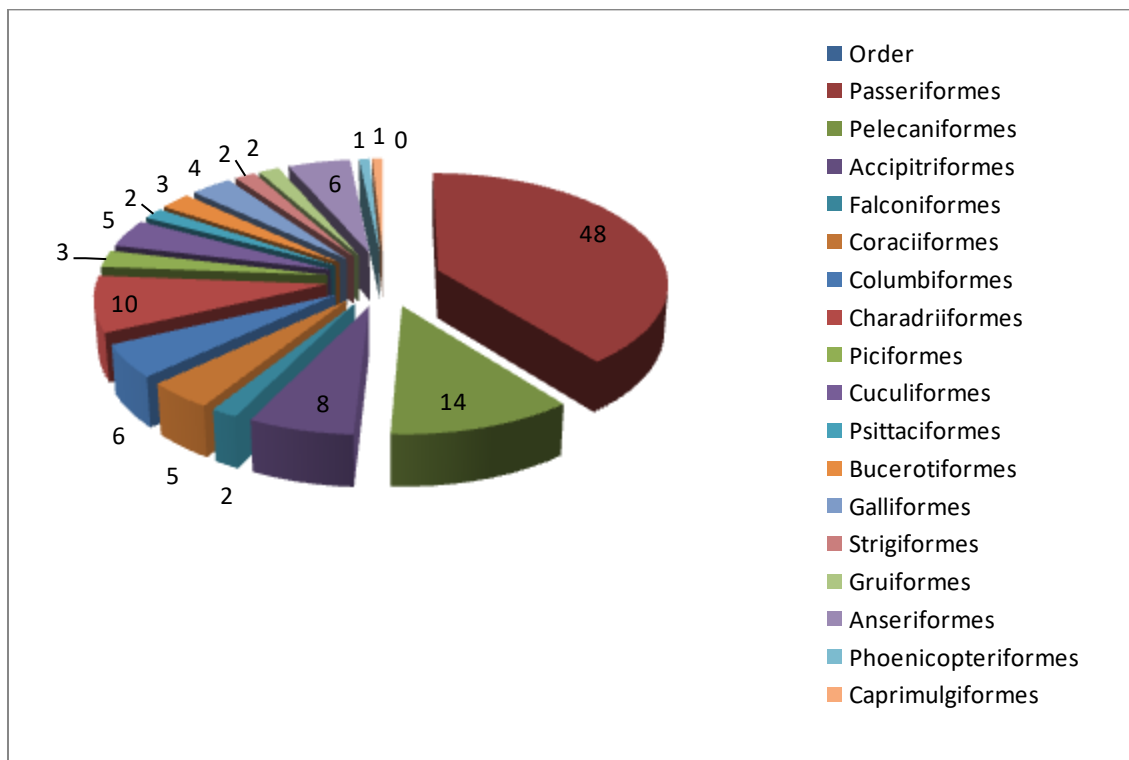


Fig1. Number of bird species observed in different orders.

5. Conclusions

Diversified habitats available in different districts of state of Haryana make this region highly rich in biodiversity especially avian fauna. This study was an attempt to analyze the avian diversity of district Karnal and some rare bird species like Alpine Swift were observed from this part of country. This list can be large in future if some serious attempts were made to explore the avian diversity of this region.

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