



Avifaunal Diversity of Bilaspur District, Himachal Pradesh, India

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Abstract

The avifaunal diversity at five study sites (Bhakhra, Naina Devi, Swarghat, Bilaspur and Ghumarwin) of Bilaspur district in Himachal Pradesh was explored during two visits (winter) in 2010-2011. In total, 111 species of birds belonging to 13 orders and 36 families were observed in Bilaspur district (43: Bhakhra, 45: Naina Devi, 31: Swarghat, 76: Bilaspur, and 42: Ghumarwin). The highest number of species were found in order Passeriformes (66)59.4% followed by Ciconiiformes (14)12.6% and least number (1)0.90% in other 5 orders. The highest number of species were found in family Muscicapidae (16)14.4% followed by Sylviidae (12) 10.8% and Corvidae 10 (9.0%) and least number (1)0.90% in other 16 families. The relative abundance of species was Very Common (12), Common (44), Uncommon (41) and Rare (14). One globally threatened (IUCN status) species Egyptian Vulture Neophron percnopterus was also reported and found to have relative abundance as Uncommon.

Keywords: Avifaunal, Diversity, Birds, Bilaspur, Himachal Pradesh.

Introduction

There are about 10,000 living species of birds in the world. Birds vary greatly in their diversity, habitats, abundance and distribution throughout the world. They have usually more diversity in tropics than temperate, alpine or polar regions. Their habitat preferences are more or less specialized. They occupy higher trophic levels in food webs. They vary in their abundance, as some species occur in large numbers while others are represented by few individuals only. Some birds have small breeding ranges in particular region only whereas others undertake long distance annual migrations throughout the world. Their distribution reflects many other wildlife groups. Birds serve as valuable indicators of changes in biodiversity and environment of the world¹.

India has more than 1250 species of birds; Grimmett et al.², Kazmierczak and Perlo³. Himachal Pradesh has diversity of more than 500 to 600 species of birds; Ali and Ripley⁴, Singh et al.⁵, Grimmett and Inskipp⁶, Besten⁷, Mahabal⁸, Thakur and Mattu⁹, Singh¹⁰. Some of the checklists of birds of Himachal Pradesh are as follows: Ali and Ripley⁴ mentioned about birds recorded in Himachal Pradesh in their book "Handbook of Birds of India and Pakistan, together with those of Bangladesh, Nepal, Bhutan and Srilanka-10 vols". Singh et al.⁵ enlisted about 358 species of birds from 2 National Parks and 29 Wildlife Sanctuaries in Himachal Pradesh. Grimmett and Inskipp⁶ enlisted about 572 species in Himachal Pradesh in their book "Birds of Northern India". Besten⁷ reported 555 species of birds in Kangra in his book "Birds of Kangra" including previous lists of Hingston, Whistler, Pandey and other sources. Mahabal⁹ made a systematic list of 447 species of birds recorded in Himachal Pradesh in publication of Zoological Survey of India

as "Fauna of Western Himalaya, Part -2". Thakur and Mattu⁹ reported 322 species in their book "Birds of Himachal Pradesh". The author¹⁰ recorded 308 species (study carried out during 2007 to 2012) in his book "Birds Recorded during a Study in Himachal Pradesh".

The avifauna of Bilaspur district has been studied in past by some workers; Jones^{11,12}, Singh et al.⁵, Mahabal and Sharma¹³, Mahabal¹⁴, Mahabal⁸. Jones¹¹ reported 274 species of birds in Shimla hills including some adjoining areas of Bilaspur also. Singh et al.⁵ observed about 15 species in Govind Sagar and Naina Devi Wildlife Sanctuary. Mahabal and Sharma¹³ reported 58 species in Naina Devi Wildlife Sanctuary. Mahabal¹⁴ studied the birds of Siwalik Himalaya and recorded 136 species from Bilaspur, Hamirpur and Una districts. Mahabal⁸ made a systematic list of 191 species of Bilaspur district.

Despite these studies, some areas of Bilaspur district were unexplored, therefore present study was undertaken. A preliminary checklist of this area has already been reported by Singh¹⁵ and Singh¹⁰. Present study aims to give further information about relative abundance, habitat and other observations of birds.

Material and Methods

Study Area: Bilaspur district (31°12'30" to 31°35'45" N, 76°23'45" to 76°55'40" E) lies in humid sub-tropical zone of Shiwalik Himalayas in Himachal Pradesh. It is bordered in south-west by Punjab state (figure-1). Bilaspur district has an area of 1167 km², terrain is mostly hilly and altitude varies from 300 meters to 1980 meters above mean sea level. Gobind Sagar Lake which is formed by Bhakra Dam on Satluj river forms the

catchment area of Bilaspur. Govind Sagar reservoir is 90 km long with an area of 168 km². Bhakhra village is famous for Bhakhra Dam (518 m long and 9 m wide). Naina Devi is famous for Naina Devi temple and Naina Devi Conservation Reserve (17 km²). The temperature of this region varies from -2°C (winter) to 40°C (summer) and average annual rainfall is 1150 mm^{16,17}.

The vegetation and habitats of study area mainly consists of dry mixed deciduous forests, subtropical broadleaved forests, coniferous (pine) forests, wetlands, lakes, streams, scrubs and agricultural lands. The sites located within an altitudinal range of 550 meters to 1100 metres above mean sea level were selected for observation of birds: (550 m- Bhakhra village and Dam surroundings; 950 m- Naina Devi including Naina Devi Wildlife Sanctuary area, Gwandal, Baroh, Dadoh and Janol); 1100 m- Swarghat including Matnoh and Panjpiri; 600 m- Bilaspur including Govindsagar Lake, Lunu, Kherian, Lakhanpur, Dukeli and Changer; and 640 m- Ghumarwin including Badu, Ratail, Nihari and Seer stream). From central point of Bilaspur, distances of these sites are: 95 km (Bhakhra), 71 (Naina Devi), 40 km (Swarghat), 20 km (Ghumarwin).

Methods: Because of large area of study sites, stratified sampling technique was adopted to include all different kinds of habitats of study area by selecting a representative sample of each habitat. Each site was searched along routes of roads, paths and other accessible ways in the periphery of about 4-6 km. Two visits (winter) were made to five study sites (Bhakhra, Naina Devi, Swarghat, Bilaspur and Ghumarwin) of Bilaspur district during 2010- 2011. Minimum 3-4 days were given to each site during any visit. The observations were done during morning (7.00-11.00 hrs) and evening times (15.00-17.00 hrs) in sufficient sunlight at local time. The relative abundance of bird species was estimated on the basis of frequency of sightings and number of birds seen. The birds were observed visually by binocular (7x35mm) and sometimes photographed for aid in identification by digital camera (12x optical zoom). The birds were identified with the help of field guides: *Pocket Guide to the Birds of the Indian Subcontinent*²; and *A Field Guide to the Birds of India, Srilanka, Pakistan, Nepal, Bhutan, Bangladesh and the Maldives*³. Nomenclature and classification follows *An Annotated Checklist of the Birds of the Oriental Region*¹⁸.

Results and Discussion

In total, 111 species of birds belonging to 13 orders and 36 families were recorded (table-1). The total number of species found in 36 families were (table-1, figure-2): Phasianidae (3) 2.7% , Anatidae (1) 0.90%, Picidae (6) 5.4%, Megalaimidae (3) 2.7%, Bucerotidae (1) 0.90%, Upupidae (1) 0.90%, Alcedinidae (1) 0.90%, Halcyonidae (1) 0.90%, Cerylidae (2) 1.8%, Centropodidae (1) 0.90%, Psittacidae (4) 3.6%, Strigidae (1) 0.90%, Columbidae (5) 4.5%, Rallidae (1) 0.90%, Scolopacidae (2) 1.8%, Charadriidae (3) 2.7%, Laridae (1) 0.90%,

Accipitridae (2) 1.8%, Phalacrocoracidae (2) 1.8%, Ardeidae (4) 3.6%, Laniidae (1) 0.90%, Corvidae (10) 9.0%, Muscicapidae (16) 14.4%, Sturnidae (2) 1.8%, Sittidae (1) 0.90%, Certhiidae (1) 0.90%, Paridae (1) 0.90%, Hirundinidae (1) 0.90%, Pycnonotidae (3) 0.90%, Cisticolidae (3) 2.7%, Zosteropidae (1) 0.90%, Sylviidae (12) 10.8%, Alaudidae (1) 0.90%, Nectariniidae (2) 1.8%, Passeridae (8) 7.2% and Fringillidae (3) 2.7%.

The highest number of species were found in order Passeriformes (66) 59.4% followed by Ciconiiformes (14) 12.6% and least number (1) 0.90% in other 5 orders. The highest number of species were found in family Muscicapidae (16) 14.4% followed by Sylviidae (12) 10.8% and Corvidae (10) 9.0% and least number (1) 0.90% in other 16 families (table-1).

The total number of species found in five study sites were (table-1): 42 (Bhakhra), 45 (Naina Devi), 28 (Swarghat), 76 (Bilaspur) and 40 (Ghumarwin).

The relative abundance (figure-2) of species was Very Common (12), Common (44), Uncommon (41) and Rare (14). The highest number of species were found in common followed uncommon, rare and very common.

Of 111 species, 17 species (Red Junglefowl, Rose-ringed Parakeet, Rock Pigeon, Black Kite, Large-billed Crow, Oriental Magpie Robin, Indian Robin, Common Myna, Great Tit, Himalayan Bulbul, Red-vented Bulbul, Grey-breasted Prinia, Oriental White Eye, Common Tailorbird, Grey-hooded Warbler, Jungle Babbler and House Sparrow) were found common in all study sites (Bhakhra, Naina Devi, Swarghat, Bilaspur and Ghumarwin). This shows that these species have common occurrence in Bilaspur district.

Of 111 species, 78 species were found common with previous records of 191 species⁶. Thus, remaining 33 species [Brown-capped Pygmy Woodpecker, Grey-capped Pygmy Woodpecker (figure-4), Brown-fronted Woodpecker, Fulvous-breasted Woodpecker, Grey-headed Woodpecker, Black-rumped Flameback, Great Barbet, Slaty-headed Parakeet, Wedge-tailed Green-Pigeon (figure-5), Black-winged Stilt, Little Ringed Plover, Great Cormorant, Grey Treepie, Dark-throated Thrush, White-tailed Rubythroat, Bluethroat, Orange-flanked Bush Robin, Brown Rock Chat, Common Starling, Wall Creeper, Streak-throated Swallow, Black Bulbul, Striated Prinia, Ashy Prinia, Puff-throated Babbler, White-browed Scimitar Babbler, Black-chinned Babbler, Oriental Skylark, Fire Breasted Flowerpecker, Crimson Sunbird, Buff-bellied Pipit, Rufous-breasted Accentor and Yellow-breasted Greenfinch] were found further additions to birdlist of Bilaspur district.

One globally threatened (IUCN status) species Egyptian Vulture *Neophron percnopterus* was found to have relative abundance as Uncommon and thus, have scope of conservation in this area.

Conclusion

As, Bilaspur district lies mostly in catchment area of Gobind Sagar Lake, so it has much scope of supporting rich bird

diversity. Presently, only winter season was covered, therefore, further explorations in different seasons of year can provide more information about status of birds.



(Map Source: www.mapsofindia.com)

Figure-1

Map showing location of study sites (Bh: Bhakhra, N: Naina Devi, S: Swarghat, B: Bilaspur, G: Ghumarwin) in Bilaspur district of Himachal Pradesh

Table-1
Systematic List of birds of Bilaspur district

Common and Scientific Names (with orders and families)	Study Sites	Habitats and birds seen in single sighting	Rel. Abu.
Galliformes phasianidae			
Grey Francolin <i>Francolinus pondicerianus</i>	B	Sl, Al, 1-2	UC
Jungle Bush Quail <i>Perdica asiatica</i>	B	Bu, 2-4	UC
Red Junglefowl <i>Gallus gallus</i>	Bh, N, S, B, G	BF, MF, Bu, 1, 2, 2-4	C
Anseriformes Anatidae			
Mallard <i>Anas platyrhynchos</i>	B	WA 2-12	UC
Piciformes Picidae			
Brown-capped Pygmy Woodpecker <i>Dendrocopos nanus</i>	Bh	BF, 1	SC
Grey-capped Pygmy Woodpecker <i>Dendrocopos canicapillus</i>	N, B, G	BF, MF, 1	C
Brown-fronted Woodpecker <i>Dendrocopos auriceps</i>	S	CF, 1	C
Fulvous-breasted Woodpecker <i>Dendrocopos macei</i>	N, B, G	BF, MF, 1	UC
Grey-headed Woodpecker <i>Picus canus</i>	S	MF, Al, 1	C
Black-rumped Flameback <i>Dinopium benghalense</i>	Bh, B	BF, Gr, Ga, 1	C
Megalaimidae			
Great Barbet <i>Megalaima virens</i>	B	MF, CF, 1-2	UC
Brown-headed Barbet <i>Megalaima zeylanica</i>	B	BF, Gr, Ga, 1-2	C
Blue-throated Barbet <i>Megalaima asiatica</i>	B, N	Ga, Gr, 1	C
Bucerotiformes Bucerotidae			
Indian Grey Hornbill <i>Ocyrceros birostris</i>	Bh, B	BF, 1-2	C
Upupiformes Upupidae			
Common Hoopoe <i>Upupa epops</i>	B	HH, La, Ga, 1-2	UC
Coraciiformes Alcedinidae			
Common Kingfisher <i>Alcedo atthis</i>	B	WA, 1	SC
Halcyonidae			
White-throated Kingfisher <i>Halcyon smyrnensis</i>	B	WA, IC, St, 1-2	C

Common and Scientific Names (with orders and families)	Study Sites	Habitats and birds seen in single sighting	Rel. Abu.
Cerylidae			
Crested Kingfisher <i>Megaceryle lugubris</i>	G	St, 1	UC
Pied Kingfisher <i>Ceryle rudis</i>	B	WA, 1	C
Cuculiformes Centropodidae			
Greater Coucal <i>Centropus sinensis</i>	B	Sl, La, Ga, 1	SC
Psittaciformes Psittacidae			
Alexandrine Parakeet <i>Psittacula eupatria</i>	B, G	Ga, Gr, MF, Al, 2-5	C
Rose-ringed Parakeet <i>Psittacula krameri</i>	Bh, N, S, B, G	HH, Ga, Gr, Al, 2-5	C
Slaty-headed Parakeet <i>Psittacula himalayana</i>	B	MF, Gr, Ga, 2-4	UC
Plum-headed Parakeet <i>Psittacula cyanocephala</i>	N, B	HH, Ga, Gr, Al, 2-5	C
Strigiformes Strigidae			
Asian Barred Owlet <i>Glaucidium cuculoides</i>	N, G	MF, BF, Gr, 1	UC
Columbiformes Columbidae			
Rock Pigeon <i>Columba livia</i>	Bh, N, S, B, G	HH, Al, La, WA, Sl, MF, 2-30	VC
Laughing Dove <i>Streptopelia senegalensis</i>	N, B	Al, La, Sl, 1-2	UC
Spotted Dove <i>Streptopelia chinensis</i>	B,G	HH, Ga, Al, Sl, La, 1-3	VC
Eurasian Collared Dove <i>Streptopelia decaocto</i>	B	HH, La, Al, 1-2	UC
Wedge-tailed Green-Pigeon <i>Treron sphenura</i>	Bh	BF, Gr, 1-3	SC
Gruiformes Rallidae			
White-breasted Waterhen <i>Amaurornis phoenicurus</i>	G	St, IC, 1-2	UC
Ciconiiformes Scolopacidae			
Green Sandpiper <i>Tringa ochropus</i>	B, G	WA, St, 1	UC
Common Sandpiper <i>Actitis hypoleucos</i>	B	WA, 1	SC
Charadriidae			
Black-winged Stilt <i>Himantopus himantopus</i>	B	WA, 2-6	C
Little Ringed Plover <i>Charadrius dubius</i>	B	WA, 1-2	UC
Red-wattled Lapwing <i>Vanellus indicus</i>	Bh, B, G	St, La, WA, Al, OA, 1-5	C

Common and Scientific Names (with orders and families)	Study Sites	Habitats and birds seen in single sighting	Rel. Abu.
Laridae			
River Tern <i>Sterna aurantia</i>	B	WA, 1-2	C
Accipitridae			
Black Kite <i>Milvus migrans</i>	Bh, N, S, B, G	WA, HH, Al, Sl Ga, Gr, MF, 1-5	VC
Egyptian Vulture <i>Neophron percnopterus</i>	N	MF, OA, 1-2	UC
Phalacrocoracidae			
Little Cormorant <i>Phalacrocorax niger</i>	Bh, B	WA, 1-6	C
Great Cormorant <i>Phalacrocorax carbo</i>	B, G	WA, St, 1-4	UC
Ardeidae			
Little Egret <i>Egretta garzetta</i>	Bh, B, G	WA, St, 1-6	C
Intermediate Egret <i>Mesophoyx intermedia</i>	B	WA, 1-2	UC
Cattle Egret <i>Bubulcus ibis</i>	B	WA, La, Al, 1-5	C
Indian Pond Heron <i>Ardeola grayii</i>	B	WA, St, 1-2	UC
Passeriformes Laniidae			
Long-tailed Shrike <i>Lanius schach</i>	Bh, N, B	Sl, Bu, 1	UC
Corvidae			
Red-billed Blue Magpie <i>Urocissa erythrorhyncha</i>	Bh, B, G	CF, MF, 1-3	C
Rufous Treepie <i>Dendrocitta vagabunda</i>	Bh, N, B, G	BF, MF, Al, Ga, Gr, 1-2	C
Grey Treepie <i>Dendrocitta formosae</i>	S	CF, 1-2	C
Large-billed Crow <i>Corvus macrorhynchos</i>	Bh, N, S, B, G	HH, MF, Al, Sl, DS, OA, 2-20	VC
Small Minivet <i>Pericrocotus cinnamomeus</i>	N	Sl, BF, 1	UC
Yellow-bellied Fantail <i>Rhipidura hypoxantha</i>	Bh, N, S, G	CF, MF, 1	UC
White-throated Fantail <i>Rhipidura albicollis</i>	Bh, N, B	Bu, CF, MF, 1	UC
White-browed Fantail <i>Rhipidura aureola</i>	Bh	He, Bu, 1	SC
Black Drongo <i>Dicrurus macrocercus</i>	Bh	Sl, He, Bu, 1-2	C
Common Woodshrike <i>Tephrodornis pondicerianus</i>	N	BF, Sl, 1	SC

Common and Scientific Names (with orders and families)	Study Sites	Habitats and birds seen in single sighting	Rel. Abu.
Muscicapidae			
Blue Whistling Thrush <i>Myophonus caeruleus</i>	Bh, N, S, B, G	St, MF, CF, 1	VC
Grey-winged Blackbird <i>Turdus bouboul</i>	N	MF, Bu, 1	SC
Dark-throated Thrush <i>Turdus ruficollis</i>	Bh, N	Ga, Gr, 1	UC
Slaty-blue Flycatcher <i>Ficedula tricolor</i>	N, G	IC, Bu, He, 1	UC
Grey-headed canary Flycatcher <i>Culicicapa ceylonensis</i>	Bh	BF, IC, Bu, 1	UC
White-tailed Rubythroat <i>Luscinia pectoralis</i>	N	Bu, 1	SC
Bluethroat <i>Luscinia svecica</i>	B	La, Bu, 1	UC
Orange-flanked Bush Robin <i>Tarsiger cyanurus</i>	S	CF, 1	UC
Oriental Magpie Robin <i>Copsychus saularis</i>	Bh, N, S, B, G	Ga, La, 1	C
Indian Robin <i>Saxicoloides fulicata</i>	Bh, N, S, B, G	Bu, Sl, BF, La, 1	C
Blue-capped Redstart <i>Phoenicurus coeruleocephalus</i>	N, S, B	Sl, CF, Gr, MF, 1, 2	C
Black Redstart <i>Phoenicurus ochruros</i>	Bh	WA, 1	UC
White-capped Water Redstart <i>Chaimarrornis leucocephalus</i>	S, B, G	St, IC, 1	C
Plumbeous Water Redstart <i>Rhyacornis fuliginosus</i>	G	St, 1, 2	C
Grey Bushchat <i>Saxicola ferrea</i>	N, B, G	Sl, He, MF, 1, 2	C
Brown Rock Chat <i>Cercomela fusca</i>	N	HH, 1	UC
Sturnidae			
Common Starling <i>Sturnus vulgaris</i>	B	Al, 2-6	UC
Common Myna <i>Acridotheres tristis</i>	Bh, N, S, B, G	HH, La, Ga, Al, Sl, 2-20	VC
Sittidae			
Wall Creeper <i>Tichodroma muraria</i>	G	St, Ro/So, 1	SC
Certhiidae			
Bar-tailed Treecreeper <i>Certhia himalayana</i>	S, B, G	MF, CF, 1	C
Paridae			
Great Tit <i>Parus major</i>	Bh, N, S, B, G	Sl, Bu, Al, Ga, Gr, MF, 1-3	VC

Common and Scientific Names (with orders and families)	Study Sites	Habitats and birds seen in single sighting	Rel. Abu.
Hirundinidae			
Streak-throated Swallow <i>Hirundo fluvicola</i>	B	WA, 2-20	C
Pycnonotidae			
Himalayan Bulbul <i>Pycnonotus leucogenys</i>	Bh, N, S, B, G	Sl, Bu, MF, BF, CF, Al, 1-3	VC
Red-vented Bulbul <i>Pycnonotus cafer</i>	Bh, N, S, B, G	Sl, Bu, MF, BF, 1-2	C
Black Bulbul <i>Hypsipetes leucocephalus</i>	B	CF, MF, 2-5	UC
Cisticolidae			
Striated Prinia <i>Prinia criniger</i>	B	Bu, He, MF, 1	UC
Grey-breasted Prinia <i>Prinia hodgsonii</i>	Bh, N, S, B, G	Bu, Sl, He, 1-3	C
Ashy Prinia <i>Prinia socialis</i>	B	Bu, He, 1	UC
Zosteropidae			
Oriental White Eye <i>Zosterops palpebrosus</i>	Bh, N, S, B, G	MF, BF, Ga, Gr, Bu, Sl, He, 1-3	VC
Sylviidae			
Common Tailorbird <i>Orthotomus sutorius</i>	Bh, N, S, B, G	Bu, He, Ga, 1	C
Common Chiffchaff <i>Phylloscopus collybita</i>	Bh	MF, Bu, 1	C
Hume's Warbler <i>Phylloscopus humei</i>	N, G	He, Bu, Ga, Sl, 1	C
Grey-hooded Warbler <i>Seicercus xanthoschistos</i>	Bh, N, S, B, G	BF, MF, Bu, Sl, He, 1-2	VC
Streaked Laughingthrush <i>Garrulax lineatus</i>	S	CF, 1	C
Puff-throated Babbler <i>Pellorneum ruficeps</i>	N	Bu, MF, 1-3	C
Rusty-cheeked Scimitar Babbler <i>Pomatorhinus erythrogenys</i>	N, B	Bu, MF, CF, 1-2	C
White-browed Scimitar Babbler <i>Pomatorhinus schisticeps</i>	Bh, B	Bu, MF, Gr, 1-2	UC
Black-chinned Babbler <i>Stachyris pyrrhops</i>	Bh, B	Bu, MF, 1	C
Yellow-eyed Babbler <i>Chrysomma sinense</i>	Bh, N, B	He, Bu, Sl, 1-2	C
Jungle Babbler <i>Turdoides striatus</i>	Bh, N, S, B, G	MF, CF, BF, Sl, Bu, La, Ga, 2-10	VC
Rufous Sibia <i>Heterophasia capistrata</i>	S	CF, 1-2	SC

Common and Scientific Names (with orders and families)	Study Sites	Habitats and birds seen in single sighting	Rel. Abu.
Alaudidae			
Oriental Skylark <i>Alauda gulgula</i>	B	WA, 2-7	UC
Nectariniidae			
Fire Breasted Flowerpecker <i>Dicaeum ignipectus</i>	S	MF, 1	UC
Crimson Sunbird <i>Aethopyga siparaja</i>	N	BF, Ga, 1	UC
Passeridae			
House Sparrow <i>Passer domesticus</i>	Bh, N, S, B, G	HH, La, Al, Ga, OA, Bu, 2-20	VC
White Wagtail <i>Motacilla alba</i>	Bh, B, G	WA, St, La, 1-6	C
White-browed Wagtail <i>Motacilla maderaspatensis</i>	Bh, B, G	WA, St, La, 1-3	C
Grey Wagtail <i>Motacilla cinerea</i>	Bh, B, G	WA, St, La, 1-2	C
Tawny Pipit <i>Anthus campestris</i>	B	WA, 1	UC
Buff-bellied Pipit <i>Anthus rubescens</i>	B	WA, 1	SC
Rufous-breasted Accentor <i>Prunella strophiatea</i>	S	CF, 1-2	SC
Scaly-breasted Munia <i>Lonchura punctulata</i>	B	He, La, 1-7	UC
Fringillidae			
Yellow-breasted Greenfinch <i>Carduelis spinoides</i>	N	Ga, Sl, La, 2-8	UC
Crested Bunting <i>Melophus lathami</i>	B	Sl, Al, 1-2	SC
White-capped Bunting <i>Emberiza stewarti</i>	Bh, N, S	CF, MF, La, 2-6	UC

Rel. Abu.: Relative Abundance

Study Sites: Bh: Bhakhra, N: Naina Devi, S: Swarghat, B: Bilaspur, G: Ghumarwin

Relative Abundance: VC: Very Common (Abundant number of sightings/81-100% of sightings)/ Abundant number of birds seen, C: Common (Regular number of sightings but less than VC/ 50-80% of sightings)/Moderate number of birds seen, UC: Uncommon (Occasional sightings/ 21-50% of sightings)/Less number of birds seen, SC: Scarce/Rare (Hardly visible/ 1-20% of sightings)/Few birds seen.

Habitats: Al: Agricultural Land, Sl: Scrub Land, MF: Mixed Forest (broadleaved and coniferous) BF: Broadleaved Forest, CF: Coniferous Forest, HH: Human Habitations, Ga: Garden, Gr: Grove, OA: Open Area, DS: Dumping Site, He: Herb, Bu: Bush, Ri/St: River/Stream, IC: Irrigation Channel, La: Lawn, Ro/So: Rock/Stone, WA: Wetland Area.

Birds seen in single sighting: i. Seen singly, ii. Seen in pair, iii. n: seen in groups. (n: 2,3,4..... etc. any number of birds)

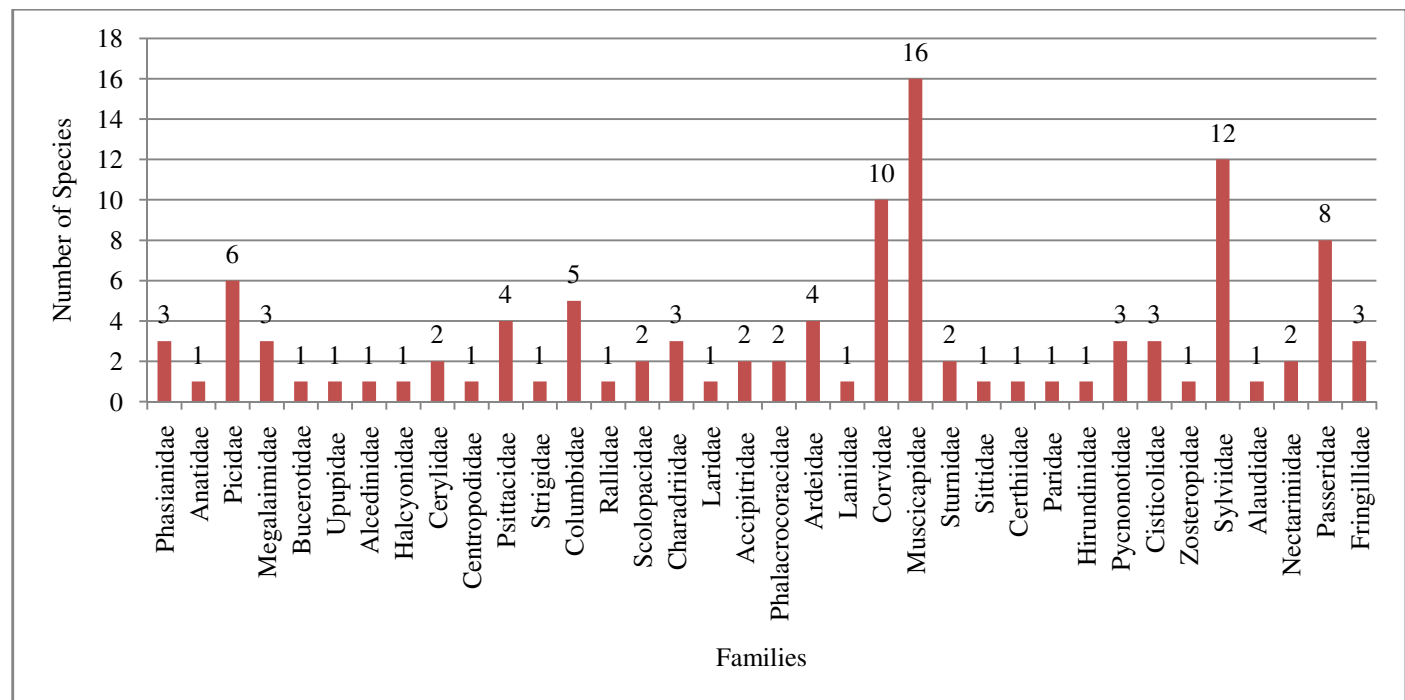


Figure-2
Family-wise distribution of bird species in Bilaspur district

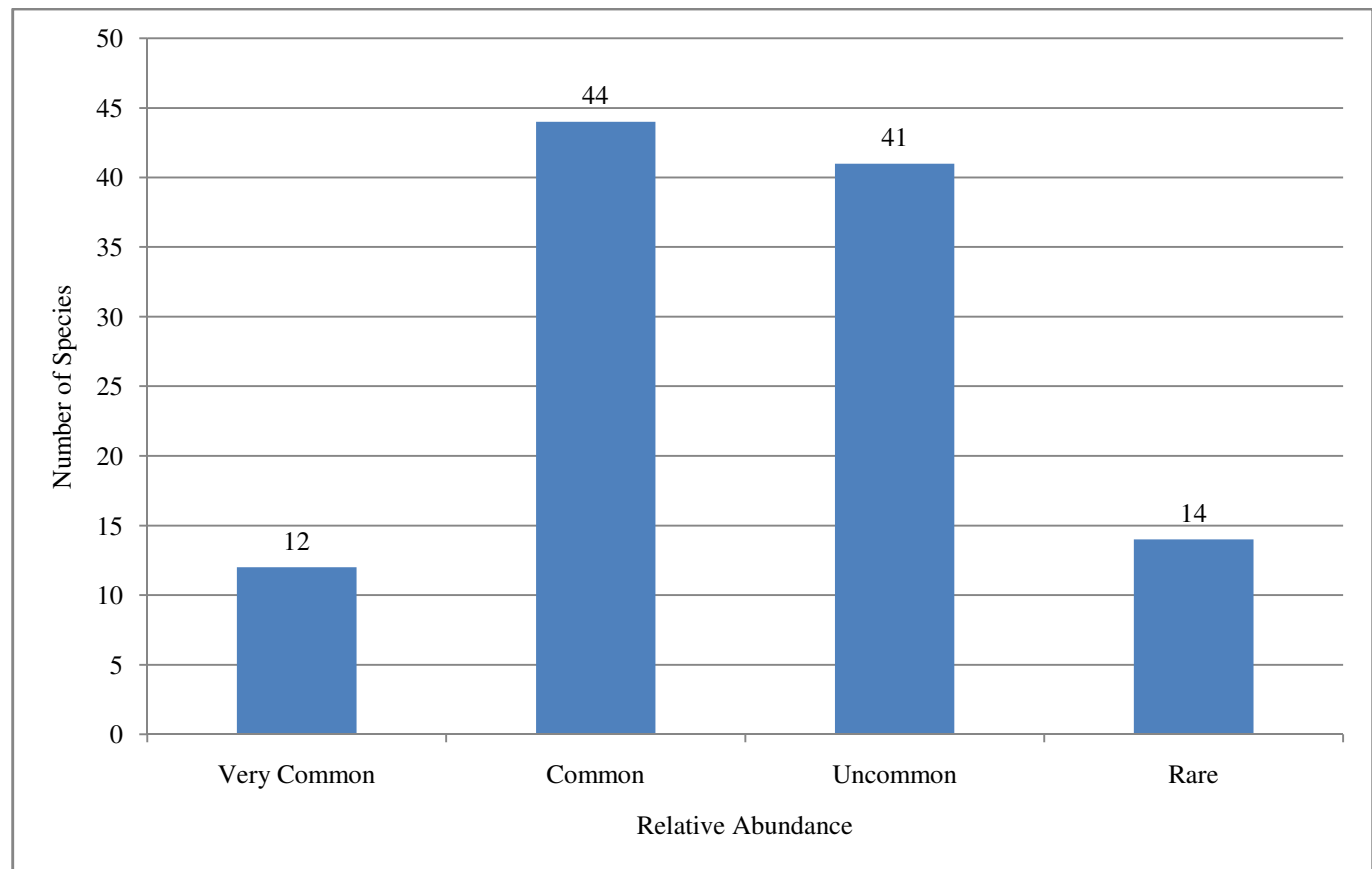


Figure-3
Relative Abundance of bird species in Bilaspur district



Figure-4
Brown-capped Pygmy Woodpecker *Dendrocopos nanus* (Bhakhra)



Figure-5
Wedge-tailed Green Pigeon *Treron sphenura* (Bhakhra)



Figure-6
Small Minivet *Pericrocotus cinnamomeus* (Naina Devi)

References

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