

Study of Avifaunal Diversity and seasonal variation in Chintamoni Kar Bird Sanctuary

¹Spandan Dasgupta, ²Pallab Dasgupta

¹Student, ²Technical Assistant
Master of Science in Forestry
Forest Research Institute, Dehradun, India

Abstract: The study deals with diversity of avifaunal species along with a comparative data of their relative abundance in two seasons taken under consideration- monsoon and post monsoon. Most diverse order of birds found in this study is Order Passeriformes maybe mostly due to their omnivorous nature. Birds of order Caprimulgiformes were found in very least number that too only in post-monsoon largely due to the leaflessness of trees in the winter times. A preliminary report on avifaunal diversity speaks about the health and quality of habitat of that place.

Index terms: Avifauna, Relative abundance, Diversity, Passeriformes, Caprimulgiformes.

I. INTRODUCTION

Estimation of avifaunal diversity of a particular area is very important ecologically as it is directly linked to the biodiversity analysis and ecological implications.

Avifaunal species are very important bio-indicators which determine the health of forests and wetlands. Birds occupy many levels of trophic webs, from mid-level consumers to top predators. As with other native organisms, birds help maintain sustainable population levels of their prey and predator species and, after death, provide food for scavengers and decomposers. Many birds are important in plant reproduction through their services as pollinators or seed dispersers. Birds also provide critical resources for their many host-specific parasites, including lice that eat only feathers, flies adapted for living on birds, and mites that hitchhike on birds from plant to plant and even between countries. Some birds are considered keystone species as their presence in (or disappearance from) an ecosystem affects other species indirectly. For example, woodpeckers create cavities that are then used by many other species. Our study was conducted to analyse the diversity and seasonal variation of birds at the selected area of Chintamoni Kar Bird Sanctuary. When any relative diversity is studied, most conveniently, two consecutive seasons of the same year is taken. With the change of seasons, the phenology and characters of green foliage changes, thus it might in many cases puts an influence on the bird abundance and diversity.

II. METHODOLOGY

The study has been done on the basis of ocular observation made during the field visit in two consecutive seasons – monsoon and post monsoon (winter). 5 points were selected randomly in one part of the sanctuary and 8 points in other part of the sanctuary with slightly dense vegetations. Birds were identified using binoculars and field guide of Grimmet *et al.*, (2016) was taken to identify the birds.

III. STUDY AREA

Chintamoni Kar Bird Sanctuary, in short CKBS, (22 25' 45" N, 88 24' 4" E) is popularly known as a protected area reputed for its extensive variety of birds, butterflies, epiphytes, ferns and orchids. It is located very close to the metropolis of Kolkata. This small sanctuary spread over 17 acres. It is also called as Narendrapur Wildlife Sanctuary.



Figure: 1 Chintamoni Kar Bird Sanctuary

(Source: <http://wildopedia.blogspot.com/2019/07/short-visit-to-chintamoni-kar-bird.html>)



Figure: 2 Entrance of the sanctuary

(Source: <https://www.theholidaystory.com/chintamani-kar-bird-sanctuary/>)

IV. DETAILS OF CKBS

This bird sanctuary used to be an old abandoned orchard and the area surrounding it is a mix of orchards, bamboo rakes, water bodies and wasteland. The orchard originally covered 27 acres but had shrunk to 17 acres by the time it was acquired. Enormous mango trees dominate the landscape of the sanctuary and are interspersed with jackfruit, coconut palm, tamarind, guava, Ficus and others trees. The area was originally proclaimed as a sanctuary in 1982 but converted after Govt. of West Bengal possessed at a significant cost in October 2005. Noted artist Chintamani Kar, along with local people and NGO's, fought for decades to obtain wildlife sanctuary status for 'Kayaler Bagan'. It was later renamed as Chintamani Kar Bird Sanctuary (CKBS).

V. REASON FOR SELECTING CKBS

Chintamani Kar bird Sanctuary is one of the major bird sanctuaries in and around Kolkata. This Sanctuary is ideally located far away from the pollution and disturbance of the metropolis. There is dense vegetation here which provides shelter to all life forms in the sanctuary. A variety of birds can be observed here which range from indigenous species to migratory birds. This sanctuary is free from human intervention as not many people know about the place.

Table 1: Study of bird diversity in Season 1 (Post Monsoon)

Serial no.	Common name	Scientific name	Order	Family	Number of birds observed
1	Red whiskered bulbul	<i>Pycnonotus jocosus</i> (Linnaeus, 1766)	Passeriformes	Pycnonotidae	2
2	Red vented bulbul	<i>Pycnonotus cafer</i> (Linnaeus, 1766)	Passeriformes	Pycnonotidae	2
3	Black hooded oriole	<i>Oriolus xanthornus</i> (Linnaeus, 1758)	Passeriformes	Oriolidae	4
4	Asian Koel	<i>Eudynamys scolopaceus</i> (Linnaeus, 1758)	Cuculiformes	Cuculidae	1
5	White-Throated Fantail	<i>Rhipidura albicollis</i> (Vieillot, 1817)	Passeriformes	Rhipidura	1
6	Rufoustreepie	<i>Dendrocitta vagabunda</i> (Latham, 1790)	Passeriformes	Corvidae	4
7	Jungle babbler	<i>Turdoides striata</i> (Dumont, 1823)	Passeriformes	Leiothrichidae	2
8	Lineatedbarbet	<i>Megalaima lineata</i> (Vieillot, 1816)	Piciformes	Megalaimidae	2
9	Cinereous tit	<i>Parus cinereus</i> (Vieillot, 1818)	Passeriformes	Paridae	2
10	Rose ringed parakeet	<i>Psittacula krameri</i> (Scopoli, 1769)	Psittaciformes	Psittaculidae	4
11	Black Drongo	<i>Dicrurus macrocerus</i> (Vieillot, 1817)	Passeriformes	Dicruridae	2

12	Black-naped monarch flycatcher	<i>Hypothymis azurea</i> (Boddaert, 1783)	Passeriformes	Monarchidae	1
13	Streak throated woodpecker	<i>Picus xanthopygaeus</i> (Gray & Gray, 1847)	Piciformes	Picidae	1
14	Oriental-magpie robin	<i>Copsychus saularis</i> (Linnaeus, 1758)	Passeriformes	Muscicapidae	2
15	Blue- throated barbet	<i>Psilopogon asiaticus</i> (Latham, 1790)	Piciformes	Megalaimidae	1
16	Green bee catcher	<i>Merops orientalis</i> Latham, 1801	Coraciiformes	Meropidae	2
17	Fulvous-breasted woodpecker	<i>Dendrocopos macei</i> (Vieillot, 1818)	Piciformes	Picidae	1
18	Orange- headed thrush	<i>Geokichla citrina</i> (Latham, 1790)	Passeriformes	Turdidae	1
19	Verediter flycatcher	<i>Eumyias thalassinus</i> (Swainson, 1838)	Passeriformes	Muscicapidae	1
20	Coppersmith barbet	<i>Psilopogon haemacephalus</i> (Statius Müller, 1776)	Piciformes	Megalaimidae	1
21	Goldenoriole	<i>Oriolus kundoo</i> Sykes, 1832	Passeriformes	Oriolidae	1
22	Large-tailed nightjar	<i>Caprimulgus macrurus</i> (Horsfield, 1821)	Caprimulgiformes	Caprimulgidae	1
23	White- throated kingfisher	<i>Halcyon smyrnensis</i> (Linnaeus, 1758)	Coraciiform	Alcedinidae	1
24	Lesser racket tailed drongo	<i>Dicrurus remifer</i> (Temminck, 1823)	Passeriformes	Dicruridae	1

Table 2: Study of bird diversity in Season 2 (Monsoon)

Serial no.	Common name	Scientific name	Order	Family	Number of birds observed
1	Red whiskered bulbul	<i>Pycnonotus jocosus</i> (Linnaeus, 1766)	Passeriformes	Pycnonotidae	1
2	Red vented bulbul	<i>Pycnonotus cafer</i> (Linnaeus, 1766)	Passeriformes	Pycnonotidae	1
3	Black hooded oriole	<i>Oriolus xanthornus</i> (Linnaeus, 1758)	Passeriformes	Oriolidae	3
4	Asian Koel	<i>Eudynamis scolopacea</i> (Linnaeus, 1758)	Cuculiformes	Cuculidae	1
5	White-throated Fantail	<i>Rhipidura albicollis</i> (Vieillot, 1817)	Passeriformes	Rhipidura	2
6	Rufoustreepie	<i>Dendrocitta vagabunda</i> (Latham, 1790)	Passeriformes	Corvidae	3
7	Hair- crested Drongo	<i>Dicrurus hottentottus</i> (Linnaeus, 1817)	Passeriformes	Dicruridae	1
8	Bronzed Drongo	<i>Dicrurus aeneus</i> (Vieillot, 1817)	Passeriformes	Dicruridae	1
9	Black Drongo	<i>Dicrurus macrocerus</i> (Vieillot, 1817)	Passeriformes	Dicruridae	2
10	Jungle babbler	<i>Turdoides striata</i> (Dumont, 1823)	Passeriformes	Leiothrichidae	1
11	Lineated barbet	<i>Megalaima lineata</i> (Vieillot,	Piciformes	Megalaimidae	1

		1816			
12	Cinereous tit	<i>Parus cinereus</i> (Vieillot, 1818)	Passeriformes	Paridae	1
13	Rose ringed parakeet	<i>Psittacula krameri</i> (Scopoli, 1769)	Psittaciformes	Psittaculidae	1

VI. OBSERVATION

While observing, there are many birds which are present in both the seasons with few exceptions. They are given below in tabular form: (Table 3)

Sl. No.	Birds observed in Monsoon	Birds observed in Post monsoon	Common birds observed in both seasons
1	Hair crested drongo	Lesser racket tailed drongo	Black drongo
2	Bronzed drongo	Oriental magpie robin	Rose-ringed parakeet
3		Large-tailed nightjar	Cinereous tit
4		Blue-throated barbet	Lineated barbet
5		Coppersmith barbet	Jungle babbler
6		Golden oriole	Rufous treepie
7		Fulvous-breasted woodpecker	White throated fantail
8		Black naped monarch	Asian koel
9		Verediter flycatcher	Black hooded oriole
10		Streak-throated woodpecker	Red vented bulbul
11		Green bee catcher	Red whiskered bulbul
12		White-throated kingfisher	

VII. STATISTICAL INTERPRETATION

Relative abundance of a species is a component of biodiversity that is used to measure the rareness of a particular species in comparison to other species of a community. This data helps us to understand the patterns of distribution that is studied under macroecology. Relative abundance is given by the formula:

$$\text{Relative Abundance} = (\text{Number of organisms of a species} / \text{Total number of organism}) \times 100$$

(Relative abundance has been calculated season-wise taking data from observation.)

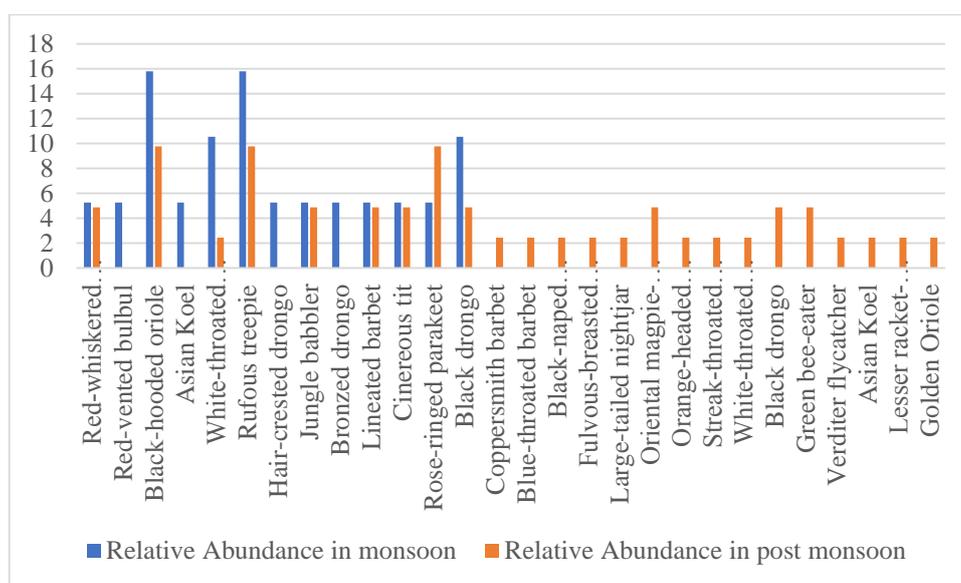
Derived from Monsoon data: (Table 4)

Common names of Birds	Bird count of the species (n_1)	Relative Abundance (R.A.% = $n_1 * 100 / N_1$)
Red-whiskered bulbul	1	5.26
Red-vented bulbul	1	5.26
Black-hooded oriole	3	15.79
Asian Koel	1	5.26
White-throated fantail	2	10.53
Rufous treepie	3	15.79
Hair-crested drongo	1	5.26
Jungle babbler	1	5.26
Bronzed drongo	1	5.26
Lineated barbet	1	5.26
Cinereous tit	1	5.26
Rose-ringed parakeet	1	5.26
Black drongo	2	10.53
Total count (N1) =	19	

Derived from Post Monsoon data: (Table 5)

Common names of Birds	Bird count of the species (n_2)	Relative Abundance (R.A.% = $n_2 * 100 / N_2$)
Cinereous tit	2	4.88
Black-hooded oriole	4	9.76
Red-whiskered bulbul	2	4.88
White -throated fantail	1	2.44
Golden oriole	1	2.44
Coppersmith barbet	1	2.44
Blue-throated barbet	1	2.44
Rose-ringed parakeet	4	9.76
Rufous treepie	4	9.76
Black-naped monarch	1	2.44

Lineated barbet	2	4.88
Fulvous-breasted woodpecker	1	2.44
Large-tailed nightjar	1	2.44
Oriental magpie-robin	2	4.88
Orange-headed thrush	1	2.44
Streak-throated woodpecker	1	2.44
White-throated kingfisher	1	2.44
Black drongo	2	4.88
Green bee-eater	2	4.88
Verditer flycatcher	1	2.44
Asian Koel	1	2.44
Jungle babbler	2	4.88
Lesser racket-tailed drongo	1	2.44
Red-vented bulbul	2	4.88
Total count (N2) =	41	



Representation of Relative Abundance
Comparative Study of birds found in two seasons: (Table 6)

Sl. No.	Bird species	No. observed in Monsoon	No. observed in Post monsoon
1	Cinereous tit	1	2
2	Black-hooded oriole	3	4
3	Red-whiskered bulbul	1	2
4	Red-vented bulbul	1	2
5	White-throated fantail	2	2
6	Golden oriole		1
7	Coppersmith barbet		1
8	Blue-throated barbet		1
9	Rose-ringed parakeet	1	4
10	Rufous treepie	3	4
11	Black-naped monarch		1
12	Lineated barbet	1	2
13	Fulvous-breasted woodpecker		1
14	Large-tailed nightjar		1
15	Oriental magpie-robin		2
16	Orange-headed thrush		1
17	Streak-throated woodpecker		1
18	White-throated kingfisher		1
19	Black drongo	2	2
20	Green bee-eater		2
21	Verditer flycatcher		1
22	Asian Koel	1	1

23	Jungle babbler	1	2
24	Lesser racket-tailed drongo		1
25	Bronzed drongo	1	
26	Hair-crested drongo	1	

Birds observed according to the Orders: (Table 7)

Sl. No.	Order	No. of birds observe in monsoon	No. of birds observed in winter
1	Passeriformes	16	26
2	Piciformes	1	6
3	Cuculiformes	1	1
4	Psittaciformes	1	4
5	Caprimulgiformes		1
6	Coraciiforms		3

VIII. DISCUSSION

Passeriformes is the most diverse order among all birds. Most of all Passeriformes birds' species are omnivorous (crow, Sparrow, songbird, finches). As the species diversity is highest and due to its omnivorous habit, the relative abundance of Passeriformes is the highest. Whereas Piciformes are mostly average insectivorous, so its relative abundance comparatively lower than Passeriformes. Relative abundance of Caprimulgiformes is lowest because most of the species of this order are nocturnal in habit, they cannot tolerate direct sunlight and they never expose themselves in open tree trunk (to escape themselves from other predators). In winter Caprimulgiformes is higher than rainy seasons as visibility chances in winter is higher as most tree become leafless conditions. Moreover, these birds show basking in winter but during rainy season the chances of visibility reduces in dense leaf and branches.

Relative abundance of different species varies in winter and rainy seasons due to the fact that during rainy seasons (due to heavy rainfall), the surroundings are full of green grasses and number of insect populations are plenty. The insects are very good food sources of all the bird species. So, the distribution of many species not only depends on only Bird sanctuary. So different species can manage to get food from anywhere showing only few dominant families remain present in sanctuary. So relative abundance is a high. But at winter most of grasses become dry which caused limitations of food source. So, most of species depends on food sources of sanctuary. Moreover, winter is the season of mate choice, nesting, breeding, and other activities. Most of the birds' species search there nesting places where both food supply and safety for their next generation will assured. Regarding these many species select the Chintamani Kar Bird sanctuary as nesting site. So relative abundance of Passeriformes reduces as this species is omnivore and they try to avoid niche overlapping. So relative abundance of Passeriformes is low in winter in compare to rainy season.

IX. CONCLUSION

Relative abundance study with ecological interpretation is a key to the better understanding of existing biodiversity of a particular region. Human encroachment and change in the habitat patterns have immense negative effect on the diversity and these studies help to tally the changes of biodiversity over a period of time.

X. ACKNOWLEDGMENT

The authors would like to thank officials of the Chintamani Kar Bird Sanctuary for allowing to work there. Special thanks to the guards and keepers in the sanctuary for their constant presence and verbal knowledge they extended to the authors.

REFERENCE

- [1] Grimmett, R., Inskipp, C., & Inskipp, T. (2016). *Birds of the Indian Subcontinent: India, Pakistan, Sri Lanka, Nepal, Bhutan, Bangladesh and the Maldives*. Bloomsbury Publishing.