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A PRELIMINARY STUDY OF AVIFAUNA OF GULBARGA FORT, KALABURAGI, 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

This paper deals with preliminary study of avifauna in and around the Gulbarga fort area, Kalaburagi, Karnataka, India. The study area is located in the Northern part of the state and lies between 76°.04′ and 77°.42 east longitude, and 17°.12′ and 17°.46′ North latitude and is placed 45 meters above the mean sea level. As the selected study area of Kalaburagi presents a number of lentic water bodies, which support a large diversity of avifauna. Study was undertaken for duration of one year from March 2019 to March 2020. The objective of the study included evaluation of species composition, abundance, species richness and distribution of avifauna in the selected study area. Wetlands around the fort area provides habitat for many types of avifaunal species which are the one of the significant indicators of the health of ecosystem. We hypothesized that large pond (moat) around the Gulbarga fort area would support a greater abundance, richness, and diversity of birds by providing grounds for feeding, breeding and nesting for many birds. Line and point transect technique method were used for the survey purpose. The field survey was made to assess avian faunal diversity by conducting weekly observations. A total of 42 species of birds belonging to 14 orders and 26 families were recorded. Among the birds recorded in this study, 16 species were Omnivorous, 9 Carnivorous, 7 Insectivorous, 4 Piscivorous, 2 Frugivorous, 2 Granivorous, 2 Herbivorous. However, pond around the fort area is in degrading condition due to the negligence of local people residing at the edge and urban conditions near to the pond. Hence, it is essential that appropriate conservation measures be taken for its successful conservation and innovations.

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1. INTRODUCTION

Bird surveys are among the most widely used biodiversity inventories and serve as a basis for increasing proportion of pure and ecological research [1] as the avifaunal assemblages have contributed significantly to the advancement of science in the field of community ecology. Comparative avifaunal diversity is an excellent indicator of ecosystem stability because birds respond quickly to changes in their environments [2]. Birds are of great economic importance of the man and they play an important role in controlling population of different pests and they play an important role as pollinators and help in seed dispersal [3]. Birds are often common denizens of the ecosystems and they have been considered as an indicator species of inhabited areas [4]. Birds will always play a vital role in the control of insect pests of agricultural crops, as predators of rodents, scavengers, seed dispensers and also their diversity is an indicator of congenial habitat for survival [5]. Many studies have shown that depressed abundance of various bird species in most human inhabited parts of the world today is of concern as cities are growing rapidly both in area and in population [6,7] and the population of birds is a very sensitive indicator of degree of pollution in both terrestrial and aquatic ecosystem [8]. There are approximately 9,990 bird species on our planet, distributed in 29 orders, 195 families, and 2,113 genera. India being a mega diversity centre, as far as bird diversity is concerned it is a blessed with more than 1200 species of birds which amounts to 13% of the bird species of the world (9600 species) [9,10]. However, with the new classification coming in to force, the number of species may will be 1300 [11].

Wetlands and water birds are inseparable elements and support a rich array of water bird communities [12]. Wetlands are important bird habitats and birds use them for breeding, nesting and rearing young ones. Birds also use wetlands as a source of drinking water and for feeding, resting, shelter, and social interactions [23]. It is estimated that freshwater wetlands alone support 20% of the known range of biodiversity in India [14]. Several ducks, geese and swans and some resident aquatic birds consume vegetative materials like root, shoot, foliage, fruits and seeds produced by the emergent, submerged and floating plants in the wetlands[15,16,17]. Now a day's urbanization is a universal phenomenon and which has negative effects on biodiversity especially in terms of habitat fragmentation and loss, extermination of native and migratory species are slowly being understood [18,19,20]. Due to the random destruction of natural habitats by cutting nesting trees and foraging plants for commercial use of woods and lands is the main factor responsible for narrow down in avian foraging habitat and their nesting sites. Thus, many species of birds may be forced to inhabit in the urban areas and constrain them to breed there [21,22]. Since there is no data pertaining to avifauna of the present study area is available so it was decided to carry out preliminary study and prepare a checklist of birds along with their approximate population, challenges before them and study probable steps for conservation. The present work was carried out at Gulbarga fort area, Kalaburagi. The large lentic water body around the fort area covers with thick bushy vegetation which will support wide range of wetland birds.

The present study is focused not only on preparing the checklist of birds, but also to find out their occurrence status and the study aims at providing the basic information of the avifauna for further studies related to avifaunal diversity in the selected study area which may help to increase consciousness about conservation of local avifauna. Recently with the decreased consciousness for biodiversity census and monitoring, many new species were reduced in the list.

2. MATERIALS AND METHODS

2.1 Study Area

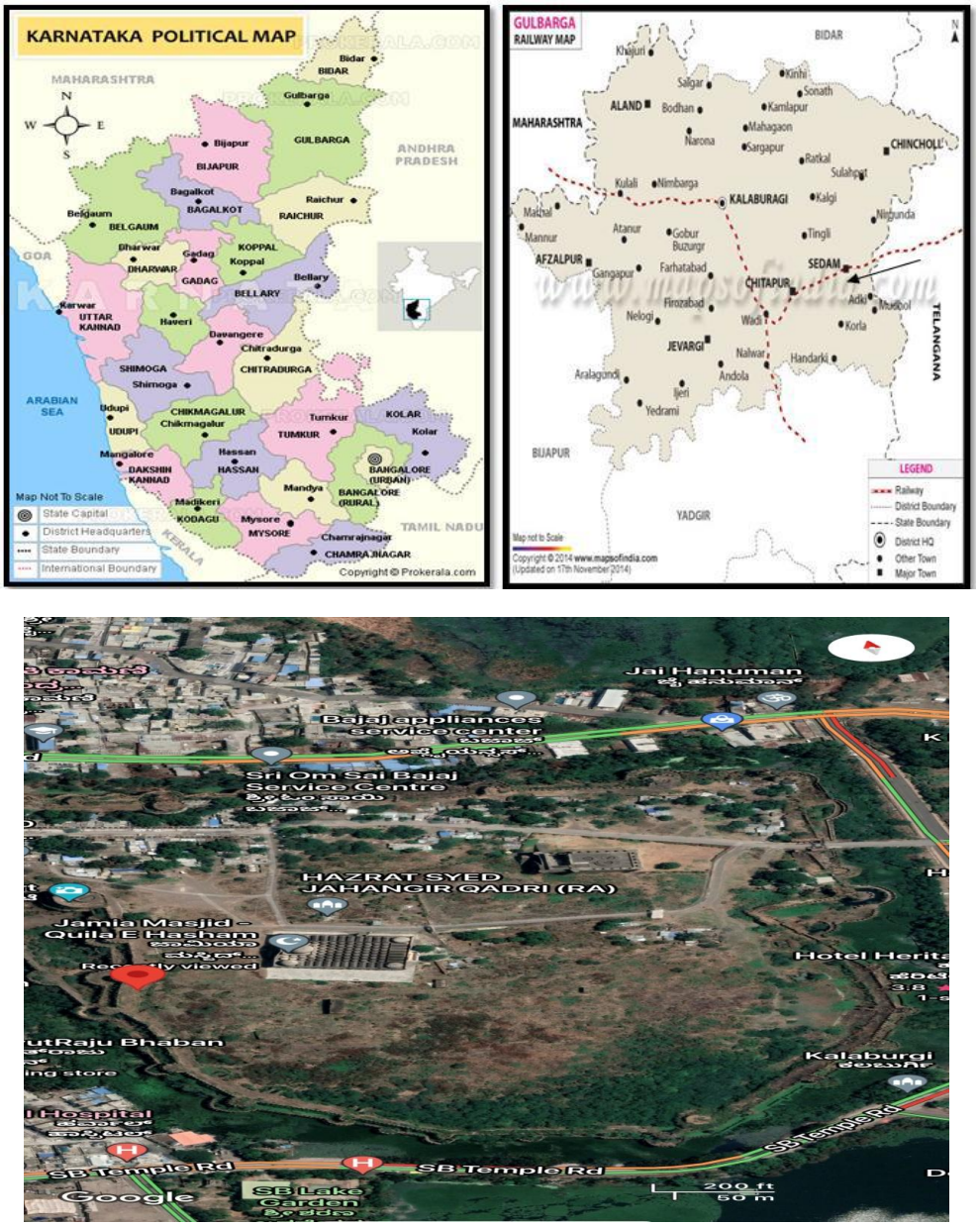
Kalaburagi district is one of the 30 districts of Karnataka State in Southern India. Kalaburagi is the administrative headquarters of the District. The study area is located in the Northern part of the state and lies between 76°.04′ and 77°.42 east longitude, and 17°.12′ and 17°.46′ North latitude and is placed 45 meters above the mean sea level. The present study was carried out at Gulbarga Fort located in Kalaburagi City. The Gulbarga Fort was built by Alauddin Hasan Bahman Shah, the ruler of the Bahmani dynasty which has an area of 0.5 acres (0.20 ha) and periphery length of 3 Kilometers (1.9 mi). It is well fortified with double fortification. A 30 feet (9.1 m) wide moat surrounds the fort. The study was carried out from March 2019 to March 2020.

The vegetation of aquatic body (Moat) around the Gulbarga fort includes *Eleocharis dulcis, Ploygonum sp., Cyperus sp., Ceratophyllum demersum, Eichhornia cracipes, Potamogeton pectinatus, Lemna purpusilla, Pistia stratiotes, Wolffia arrhizaand* etc which supports wide range of aquatic birds. These birds were seen consuming the selected parts such as

roots, foliage, shoots, flowers, seeds and fruits of plant species depending on their palatability. For detailed taxonomic description different books on aquatic Plant Taxonomy are referred [23,24].

2.2 Methodology

Avifaunal diversity in and around the Gulbarga fort area was recorded for a period of one year to record the seasonal variation in avifaunal diversity. Regular field visits were made throughout the study period. We visited the fort regularly at 6.30 am to 10.30am in morning and 4.00 pm to 6.30 pm in evening. However sometimes we have observed throughout the day also. The methods followed for the field study and survey include Line transect method [25] and point transects method [26]. The other most important aspect kept in consideration was to make the observations during the peak activity of birds. Since the peak activity in most birds lasts for 1 or 2 hours after sunrise or before sunset, so monitoring of transects was done either in early morning or late evening hours as used by Thakur [27]. All observations were made using



Study Area Location (Map)

binocular (Olympus 10X42 pro), photographic documentation was done with DSLR (Digital Single Lens Reflex) camera (Canon 40 D and Nikon). The materials used for the successful completion of our Survey were data sheet, pencils and eraser. Few reference books and field books were also used for recording birds and vegetation data. The photography was done and the identification and classification of bird was made on the basis of standard field guides by Ali and Ripley [15,28].

3. RESULTS AND DISCUSSION

A total 42 species of birds belonging to different orders were recorded in selected study area. These aviafaunal species belongs to the orders such as Accipitriformes, Anseriformes, Bucerotiformes, Charadriiformes, Ciconiiformes, Columbiformes, Coraciiformes, Cuculiformes, Galliformes, Passeriformes, Pelecaniformes, Podicipediformes, Psittaciformes, Suliformes are shown in Table 1 and Fig. 1. The avian fauna recorded in the study includes both terrestrial and aquatic birds. Based on the feeding habitat, from the present data it is apparent that the avifauna of the study area is dominated by Omnivorous (16 species) followed by Carnivorous(9), Insectivorous(7), Piscivorous(4), Frugivorous(2), Granivorous(2), Herbivorous(2) birds respectively and the same is represented in the Fig. 2.

Table 1. Systematic list of Bird species at Gulbarga Fort, Kalaburagi, Karnataka

Sl. No	Order and Family	Common Name	Scientific Name	Main feeding Status
1)	**Accipitriformes**			
	1. Accipitridae	1. Black Kite	*Milvus migrans*	**C**
		2. Indian Shikra	*Accipiter badius*	**C**
2)	**Anseriformes**			
	2. Anatidae	3. Grey Lag Goose	*Anser anser*	**H**
		4. Indian Spot Billed Duck	*Anas poecilorhyncha*	**O**
3)	**Bucerotiformes**			
	3. Bucerotidae	5. Indian Grey Horn Bill	*Ocyceros birostris*	**O**
4)	**Charadriiformes**			
	4. Charadriidae	6. Red Wattled Lapwing	*Vanellus indicus*	**O**
	5. Recurvirostridae	7. Black Winged Stilt	*Himantopus himantopus*	**C**
5)	**Ciconiiformes**			
	6. Ciconiidae	8. White Stork	*Ciconia ciconia*	**C**
6)	**Columbiformes**			
	7. Columbidae	9. Blue Rock Pigeon	*Columba livia*	**G**
		10. Laughing Dove	*Spilopelia senegalensis*	**G**
7)	**Coraciiformes**			
	8. Alcedinidae	11. Common Kingfisher	*Alcedo atthis*	**P**
		12.White Breasted Kingfisher	*Halcyon smyrnensis*	**C**
	9. Meropidae	13.Asian Green Bee Eater	*Merops orientalis*	**I**
		14. Blue Cheeked Bee Eater	*Merops superciliosus*	**I**
8)	**Cuculiformes**			
	10. Cuculidae	15. Asian Koel	*Eudynamys scolopaceus*	**O**
		16. Greater Coucal	*Centropus sinensis*	**O**
9)	**Galliformes**			
	11. Phasianidae	17. Painted Bush Quail	*Perdicula erythrorhyncha*	**O**
		18. Rock Bush Quail	*Perdicula argoondah*	**O**
	12. Rallidae	19. Common Coot	*Fulica atra*	**O**
		20. Purple moorhen	*Porphyrio porphyrio*	**O**
10)	**Passeriformes**			
	13. Corvidae	21. House Crow	*Corvus splendens*	**O**
		22. Jungle Crow	*Corvus macrorhynchos*	**O**
	14. Dicruridae	23. Black Drongo	*Dicrurus macrocercus*	**I**
	15. Estrildidae	24. Scaly-breasted munia	*Lonchura punctulata*	**H**

Sl. No	Order and Family	Common Name	Scientific Name	Main feeding Status
		or Spotted munia		
	16. Muscicapidae	25. Brown Rock Chat	*Cercomela fusca*	**I**
		26. Indian Robin	*Saxicoloides fulicatus*	**I**
		27. Pied Bush Chat	*Saxicola caprata*	**I**
	17. Oriolidae	28. Indian Golden Oriole	*Oriolus Kundoo*	**F**
	18. Passeridae	29. House Sparrow	*Passer domesticus*	**O**
	19. Ploceidae	30. Baya Weaver	*Ploceus philippinus*	**O**
	20. Pycnonotidae	31. Red Vented Bulbul	*Pycnonotus cafer*	**O**
	21. Sturnidae	32. Brahminy Starling	*Sturnia pagodarum*	**O**
		33. Common Myna	*Acridotheres tristis*	**O**
11)	**Pelecaniformes**			
	22. Ardeidae	34. Cattle Egret	*Bubulcuc ibis*	**I**
		35. Grey Heron	*Ardea cinerea*	**C**
		36. Indian Pond Heron	*Ardeola grayii*	**P**
		37. Little Egret	*Egretta garzetta*	**P**
		38. Purple Heron	*Ardea purpurea*	**C**
	23. Threskionithidae	39. Black Headed Ibis	*Threskiornis melanoceohalus*	**C**
12)	**Podicipediformes**			
	24. Podicipedidae	40. Little Grebe	*Tachybaptus ruficollis*	**C**
13)	**Psittaciformes**			
	25. Psittacidae	41. Rose Ringed Parakeet	*Psittacula Krameri*	**F**
14)	**Suliformes**			
	26. Phalacrocoracidae	42. Little Cormorant	*Microcarbo niger*	**P**

O: Omnivorous C: Carnivorous I: Insectivorous, P: Piscivorous F: Frugivorous G: Granivorous

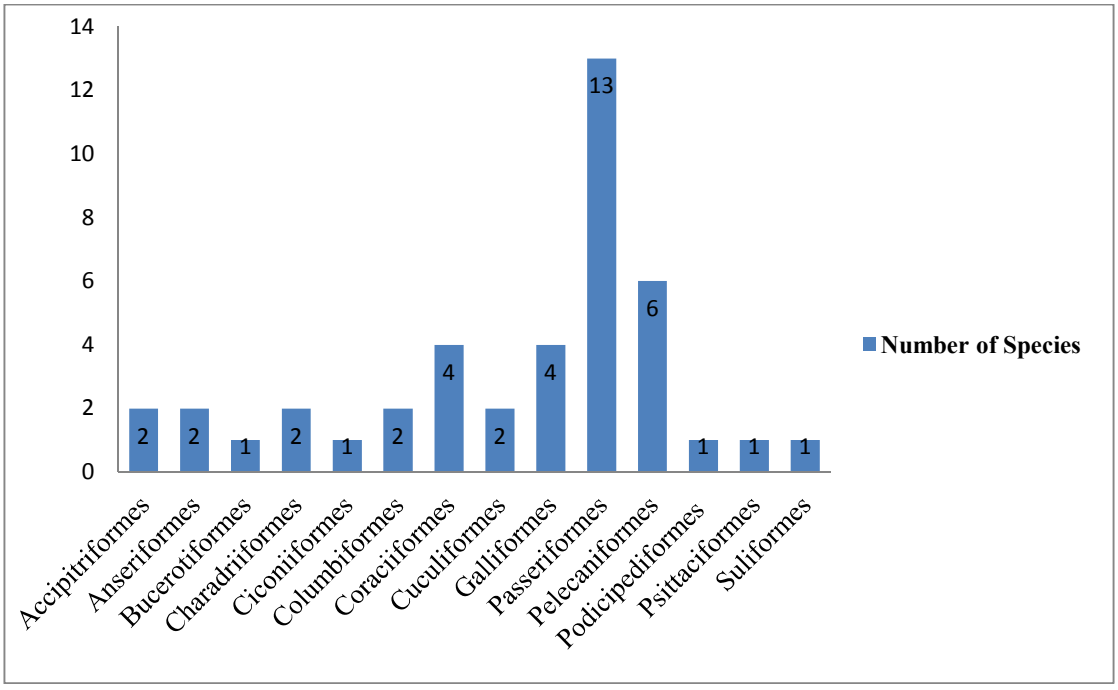


Fig. 1. Graph representing the distribution of avifaunal species belonging to different orders

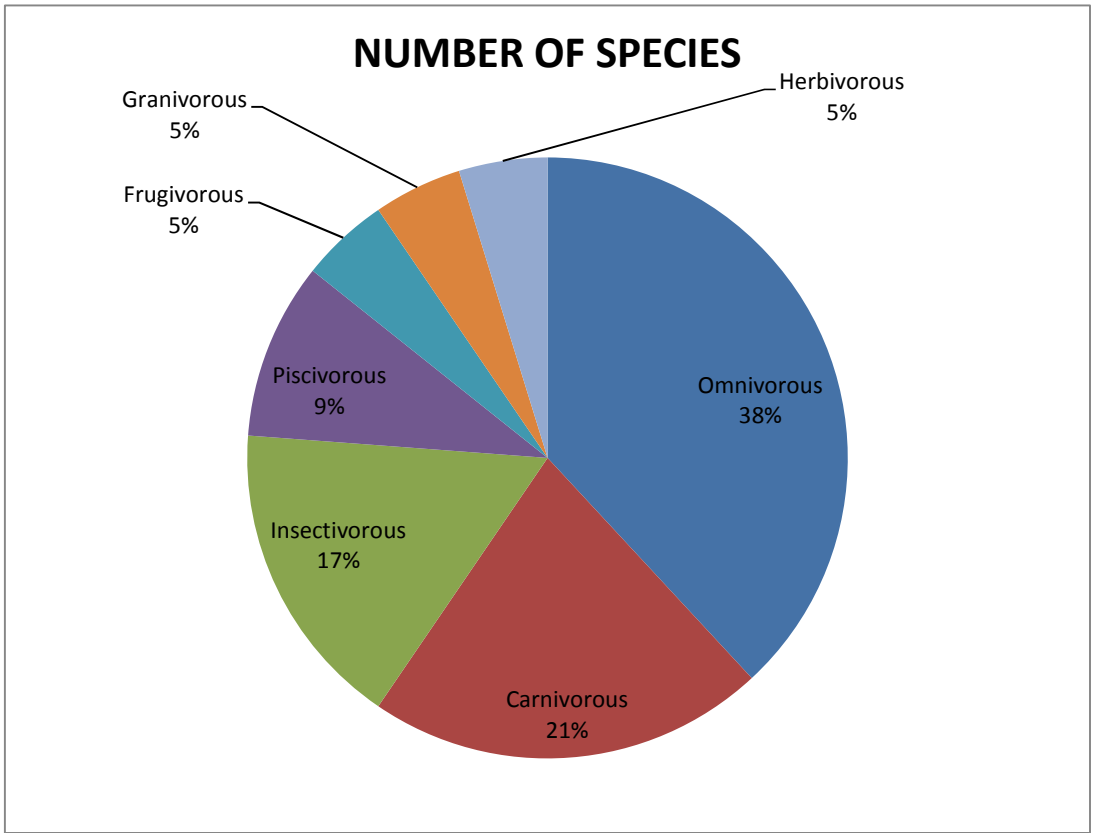


Fig. 2. Pie chart representing percentage composition of birds according to their feeding habitat

4. CONCLUSION

The observation and data collected from present study area i.e. Gulbarga fort Kalaburagi, Karnataka State, India reveals that the study area supports a healthy avian diversity. The present study which recorded 42 species of birds which reflects a moderately healthy overall biodiversity for study location. In winter season maximum bird diversity was observed this study area provides feeding and breeding ground for many birds. But now a day's anthropogenic activities are a concern for the existing bird diversity of the study area as the human activities may be a cause for destruction of feeding and foraging habitat of many birds. Hence the one and only way to save avifauna from being wiped out from this particular ecosystem is by following the method of sustainable development, where unnecessary destruction of habitat for construction has to be reduced, undergrowth has to be left undisturbed, natural growth of plants like reeds many bushy vegetation's has to be supported and planting of fruiting trees with the help of scientific knowledge has to be increased to facilitate the foraging, sheltering and breeding of birds. Finally to conclude it may be noted that the area was studied for short time span, a more intensive study would surely result in identifying more bird species.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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