

Study on avifaunal diversity in Durgadahalli and Mydala lakes of Tumakuru, Karnataka

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ABSTRACT

The rapid avifaunal diversity assessment was carried out at two different locations Durgadahalli and Mydala lakes Tumakuru, during 2017-2019. A total of twenty (20) different birds was recorded in both lakes belonging to orders Podicipediformes, Pelecaniformes, Ciconiiformes, Falconiformes, Gruiformes, Charadriiformes and Coraciiformes. They belonging to families Podicipitidae, Phalacrocoracidae, Ardeidae, Accipitridae, Rallidae, Charadriidae, Laridae and Alcedinidae respectively. In Durgadahalli lake, 13 species from seven orders that belong to seven families except for Laridae were recorded. Among the seven families, Ardeidae had highest number of species, while in Mydala lake, 19 species belong to seven orders and eight families were recorded. Where family Ardeidae and Charadriidae, shows a highest number of species which was probably due to rich diversity of aquatic organisms.

Keywords: Bird diversity, Habitat, Durgadahalli lake, Mydala lake

Introduction

The study of bird's diversity is an essential ecological tool and acts as habitat indicator (Bilgrami, 1995) and they are sensitive to environmental changes helps to assessing the status of ecosystem health (Taper *et al.*, 1995; Olechnowski, 2009). The water birds and wetland birds are dependent on wetland habitats (Weller, 1999). The wetlands are serving as feeding, breeding, resting and roosting areas for different species of resident and migratory birds (Broyer and Calenge, 2010). The presence of various microhabitats in wetlands such as open water, mudflats, submerged vegetation, emergent vegetation increases the population, abundance, richness and diversity of birds (Murphy *et al.*, 1984; Safran *et al.*, 1997). The most interesting fact of birds is, they found mainly on wetlands free from pollution, rich in food availability and the lack of anthropogenic

pressure (Paracuellos, 2006). The Indian subcontinent has diverse avifauna with 1300 bird species and highly varied climatic conditions, unique habitats, long stretch of inland, forest and coastal areas which attracts and supports a unique group of avian species round the year (Grimmett *et al.*, 1999).

Lakes are inland depressions containing standing water, many of the lakes have outlet streams and more or less temporary features on the landscape. Distribution of aquatic organisms in lakes is influenced by light intensity, wavelength absorption, hydrostatic pressure, temperature, etc. Unfortunately, global diversity of birds is declining continually due to anthropogenic disturbances (Rapoport, 1993) and climate change (Chen *et al.*, 2011; Sekercioglu *et al.*, 2012). The IUCN Red List of endangered birds has already recognized 1226 bird species as threatened globally and India with 88 threatened bird species is ranked at seventh position

(BirdLife International, 2010). In the present study, Durgadahalli and Mydala lakes of Tumkur have been selected to observe the diversity of birds. A proper scientific study of bird diversity in wetlands of Karnataka is deficient, particularly in and around Tumkur are neglected. Hence it is very essential and prime concern to study diversity of birds. The water of these lakes is mainly used for domestic, irrigation and fishing purposes.

Materials and Methods

Study area

a. Durgadahalli lake

Durgadahalli lake (lat.: $13^{\circ} 13' 56''$ N; long.: $77^{\circ} 25' 30''$ E) (Fig. 1) is situated about 15 km away from Tumkur city. This lake is a perennial water body having an area of about 15.60 hectares, maximum depth of about 2.0 m along the bund, the total catchment area is 17.25 km^2 . Height was about 10.4 to 10.6 m with an average rain fall of 620 mm.

b. Mydala lake

Mydala lake (lat.: $13^{\circ} 18' 46''$ N, long.: $77^{\circ} 11' 37''$ E) (Fig. 1) is situated at about 20 km away from the city. This lake is a perennial water body having an area of about 370 hectares, depth of about 3.0 to 4.4 m along the bund, the total catchment area is 62.96 km^2 . Height is about 13 to 14.8 m with an average rainfall 640.27 mm.

Bird Watching Technique

Identifying a bird can be a challenging process and they are active, energetic animals. Quick eye spotting is required in order to get possible detail in short span of time. The following techniques were used during bird watching and recognized by fixing eye on them. Continuous observations were made regarding their movement, songs, feeding habit and size. Simultaneously specific calls and songs were also identified general size, shape, distinctive strips and patches of colour including crown strips, eye lines, nape colour, eye arcs or rings and birds bill size were noted. Wing bars, colour patches and marking on bird body during stationary stage or fly-

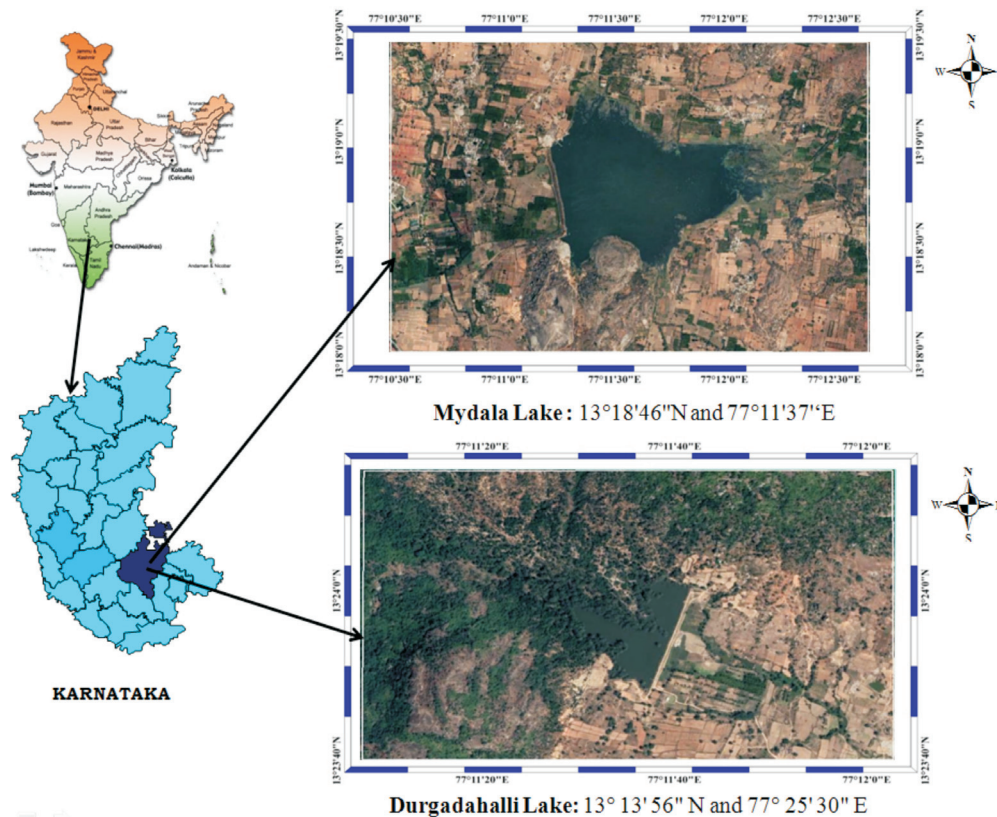


Fig. 1. Location of the study area

ing stage were noted. Leg colour and length were also noted in each observation. The survey was conducted either during the morning time zone (between 07:00–09:00hr) or during the evening time zone (between 16:00–18:00hr) when there is maximum bird activity (Cunningham *et al.*, 2006; Simons *et al.*, 2006).

Results and Discussion

In the present study, we recorded twenty (20) different birds in both Durgadahalli and Mydala lakes (Table 1) belonging to orders Podicipediformes, Pelecaniformes, Ciconiiformes, Falconiformes, Gruiformes, Charadriiformes and Coraciiformes. They belonging to families Podicipitidae, Phalacrocoracidae, Ardeidae, Accipitridae, Rallidae, Charadriidae, Laridae and Alcedinidae respectively. In Durgadahalli lake, 13 species from seven orders that belong to seven families except for Laridae were recorded. Among the seven families, Ardeidae had highest number of species (Table 1), while in Mydala lake, 19 species belong to seven orders and eight families were recorded. Where family Ardeidae and Charadriidae, shows a highest number of species (Table 1). The rich diversity of birds was documented in the present study it's may be due to availability of various sources of food as well as foraging and birds are being heterogeneous in their feeding habits (Ali and Ripley, 1987). The rich Ichthyofaunal diversity in Durgadahalli and Mydala lake were reported by Shivaraju *et al.*, (2017, 2018), which directly influence on diversity of birds. The agricultural crops with stray trees and scattered vegetation might have extended comfortable shelter and foraging grounds. The study area supports different food sources like fish, crustaceans, invertebrates, water plants and planktons (Shivaraju *et al.*, 2019). The Jaccard similarity index (J) for avian fauna was 1.50.

Nadaf and Ganesh, (2016) reported 53 species of birds in lakes of Dharwad, Karnataka State, Rajashekara and Venkatesha (2010) reported 34 species in

Table 1. Diversity of birds in Durgadahalli and Mydala lakes, Tumakuru

Sl. No	Order	Family	Scientific name	Common name	Durgadahalli lake	Mydala lake
1	Podicipediformes	Podicipitidae	<i>Tachybaptus ruficollis</i> (Pallas, 1764)	Little grebe	+	+
2	Pelecaniformes	Phalacrocoracidae	<i>Phalacrocorax nigripennis</i> (Vieillot, 1817)	Little cormorant	+	+
3			<i>Phalacrocorax carbo</i> (Linnaeus, 1758)	Great cormorant	+	+
4	Ciconiiformes	Ardeidae	<i>Ardeolagrayii</i> (Sykes, 1832)	Pond heron	+	+
5			<i>Bubulcus ibis</i> (Linnaeus, 1758)	Cattle egret	+	+
6			<i>Casmerodius albus</i> (Linnaeus, 1758)	Great egret	+	+
7			<i>Mesophoyx intermedia</i> (Wagler, 1829)	Median egret	-	+
8			<i>Egretta garzetta</i> (Linnaeus, 1766)	Little egret	+	+
9	Falconiformes	Accipitridae	<i>Milvius migrans</i> (Boddaert, 1783)	Common Pariahkite (Black kite)	-	+
10			<i>Haliaeetus Indus</i> (Boddaert, 1783)	Brahminy Kite	+	+
11	Gruiformes	Rallidae	<i>Amurornis phoenicurus</i> (Pennant, J 1769)	White breasted water hen	+	+
12	Charadriiformes	Charadriidae	<i>Vanellus indicus</i> (Boddaert, 1783)	Red wattle lapwing	+	+
13			<i>Charadrius dubius</i> Scopoli, 1786	Little ringed plover	-	+
14			<i>Tringahypoleucos</i> Linnaeus, 1758	Common sand piper	+	-
15			<i>Calidris minuta</i> (Leisler, 1812)	Little Stint	+	+
16		Laridae	<i>Sterna aurantia</i> (J.E. Gray, 1831)	Indian River Tern	-	+
17			<i>Sterna hirundo</i> Linnaeus, 1758	Common Tern	-	+
18	Coraciiformes	Alcedinidae	<i>Hylcyon mynensis</i> (Linnaeus, 1758)	White breasted kingfisher	+	+
19			<i>Alcedo atthis</i> (Linnaeus, 1758)	Small blue kingfisher	-	+
20			<i>Ceryle rudis</i> (Linnaeus, 1758)	Pied Kingfisher	-	+

lakes of Bangalore city, Girma and Admassu (2019) reported 14 birds in Lake Hora-Arsedi, Bishoftu, Ethiopia, Singh *et al.*, (2018) reported 61 birds in Udaipur district, Sharon *et al.*, (2019) recorded 50 bird species in Kumarasamy lake and Singanallur lake, whose results are similar to findings of the present study. Wetlands serve as feeding, breeding, resting and roosting areas for different species of resident and migratory birds (Broyer and Calenge, 2010). The most interesting fact of birds was found mainly on wetlands which were free from pollution, had rich food availability and lacked anthropogenic pressure (Paracuellos, 2006). The richness of birds may be due to the availability of food and ecological conditions which supported breeding and nesting behaviors.

Conclusion

The present study illustrates the importance of the area as a good habitat for avifauna and also provide the base line research data for further work. We strongly recommended that conservation and importance measures to be integrated into policy frameworks. Thus, it can be concluded that the variation in the water quality and the availability of different prey determined the distribution and diversity of aquatic birds in the area during the study period. This study is proved that the water birds play an important role of the ecosystems as a biological agent of insect pest, helping the farmers in the way of giving free manure in the form of guanos, etc. In the study area food availability is conspicuous and reflects the status of habitat at a given time of a particular wetland. Present days due to anthropogenic activities and burgeoning development has caused a substantial loss of wetland resources and rapid decline of waterbird species. For effective management and conservation of wetlands and their inhabitants the waterbirds should be taken care for feeding, breeding and other activities.

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