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Diversity of avifauna in Mydala Wetland of Tumkur, Karnataka, India

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Abstract
The Mydala Wetland which is situated near Tumakuru, Karnataka State, India, provides territory for various avifauna. Different avian species were recorded in different seasons. They are common natives of the terrestrial and aquatic ecosystems and have been considered as an indicator species of inhabited areas. They are very sensitive indicators for pollution and functions as early warning system. Observations were made on the occurrence and diversity of avifauna January 2020 to December 2020. During the present study, totally 71 species were identified belonging to 30 families and 14 orders were recorded from the wetland. More species were sighted in order Passeriformes, followed by Charadriiformes and Ciconiiformes. It was evident that Purple Moorhen, Coots and Ducts have developed high tolerance to this highly fluctuating habitat and human anthropogenic activity.

Keywords: avifauna, Diversity, Status, Mydala Wetland, anthropogenic activity

Introduction
Wetlands are defined as lands transitional between terrestrial and aquatic eco-systems where the water table is usually at or near the surface or the land is covered by shallow water (Mitsch and Gosselink 1986) [1]. The various ponds, numerous tanks, lakes, swamps, marshy lands including mangrove ecosystem, shallow rivers, reservoirs, etc. are support wetland biodiversity. Including wet paddy fields wetlands occupy 58.1 million hectares in India, (Prasad *et al*., 2002) [2]. Wetlands alone support 10 percent of the known range of biodiversity in India (Deepa and Ramachandra 1999) [3] including 2400 species and sub species of birds. Birds are spectacular creation of nature and have a crucial position in the food chain of an ecosystem.
Wetland is an ecosystem that is helpful to maintain biodiversity. Almost 25% of the bird species found (1224 species belonging to 78 families and 17 orders) in India and are dependent on wetlands Jamwal *et al.*, (2017) [4]. Wetlands were lost in the 20th century, mainly to agriculture and urbanization. At the same time loss of water bird habitats through direct and indirect human interferences has led to a decline in several bird population, Natural wetlands provide important functions that are essential to the functioning of biotic communities and maintaining quality of the environment *(Noble and Hemesns 1978*) [5]. Wetlands are inhabited by many birds as their natural habitat for various reasons. Birds get food, water, shelter from the wetlands and also use wetlands for breeding, for rearing the young ones and even for social interactions. Therefore, wetlands are important to keep the avian diversity maintained and also play a vital role in controlling the pest population in agricultural systems. The present study was undertaken to record the avifauna of the Mydala wetland site. The selected site is undisturbed and in its natural condition. Fishing is only done by some natives for their livelihood. Localities should have awareness about wetland and birds importance, they will be maintained in the future. Therefore, the present study will contribute to the same thing and it will eventually be helpful to conserve wetlands in general and avian diversity in particular.

Study area
The Mydala wetland of Tumakuru district, Karnataka, India, is a pond located 20km from centre of Tumakuru city towards north east. It lies at 13°18’46’’N latitude and 77°11'37"E longitude (Fig. 1 and Table 1) and water spread area is 370 hectares. The average depth of the lake is 3.0 to 4.4 meters along the bund. This water is mainly used for drinking purpose and cultivation of paddy crops in and around the wetland area. The total catchment area of the Mydala lake is 62.96 sq.km and height is about 13 to 14.8m with an average rain fall 640.27mm, temperature about 24ºC to 26ºC and soil in the catchment area is black clay/loamy. Mydala Wetland is considered as largest one of fisheries resource.. Many invertebrates are seen at marshy region, which becomes a feast for the birds. Due to all these circumstances, this wetland site is accompanied with sufficient food sources, shelter and favourable climatic conditions which are necessary for the avian community.

Materials and Methods
The surveys were carried out continuously for 24 months from January 2020 to December 2020 to obtain basic bird composition data. Birds were observed from 6.30 a.m to 11.30 a.m by using Olympus binoculars (10 x 50) each month, weekly twice and photos were taken by using cannon camera (EOS 1100D). The recorded species

were identified using the books of "Birds of the Indian subcontinent" by (Richard Grimmott, et al., 2014) [6] and The field book of Ali and Ripley (1986) [7], Ali (1996) [8]. The bird population was estimated by direct counting method. In this method, a suitable vantage point is selected and all visible birds are counted. Total count method was also used wherever possible by walking around the wetlands.

Results and Discussion

The present investigation was envisaged to investigate and conduct survey on the distribution and diversity of avifauna in Mydala wetland. A total 71 species (Table. 1) were identified belonging to 30 families and 14 orders were recorded from the wetland. More species were sighted in order Passiriforms (19.7%), followed by Charadriformes (18.3), Ciconiformes (15.49%), Anseriformes (9.85%), Gruiformes (8.45%), Pelecaniformes (7.04), Falconiforms (5.6%), Coraciiformes(5.6%), Cuculiformes (2.81%) Podicipodiformes (1.4%), Columbiformes (1.4%), Psittaciformes (1.4%), Apodiformes (1.4%) and Piciformes (1.4%) (Table.2). From the Table. 1 and 2. it is clear that the studied area Mydala was found to be rich in distribution of various avian bird species. The maximum diversity was recorded at the areas having maximum vegetation (emergent and floating) as dense vegetation benefit the nest building of birds and enhance their breeding success (Froneman et al., 2001)[9] and also provides shelter and because of little human disturbance (Hattori and Mae, 2001)[10]. All the recorded 71 species of the Mydala wetland study habitant clearly indicated the higher frequent distribution of the resident type bird species. These results were also indicative of the inconsistent distribution of the most predominant species hence indicated the transformation of the different variable causing the quality and the healthy condition of the habitat ecosystem of Mydala wetland. (Fig.1). The seasonal variation of the bird population in Mydala wetland for the study period from January 2020 to December 2020 was discussed in the Fig. 2. From the recordings it was clear that the studied area was found to be rich in the distribution of various avian bird species across the different seasons studied such as Pre monsoon, Monsoon and Post monsoon and the average number measured throughout the period of the study from January 2020 to December 2020 of all the seasons confirmed the same. Among the 71 different species recorded in the period of investigation measured in all the three seasons i.e. as Pre monsoon, Monsoon and Post monsoon, species such as Painted stork, Cattle egret, Coot, were found to be very rich in occurrence and the distribution, this was observed across the various seasons i.e. as Pre monsoon, Monsoon and Post monsoon (Fig 2.).

Conclusion

The counts of the seasonal based distribution of the recorded species revealed that, the studied region is still capable as potential habitats for declining population of the migratory birds. Study region is especially mainly used for drinking purpose and domestic purpose hence it was observed that very high amount of human interference. Anthropogenic activities of different kind would be the most important reason for dejected bird's species diversity. The water quality seems to be declined due to the release of treated effluent water from water treatment plant located near the study regions could be main reason for declining bird species in the study area. In payable of these anthropogenic activities, current avian species diversity of the study areas likely to be turns down further. Regrettably, these factors are receiving completely invalid by the various profitable activities owing to the anthropogenic activities. There is an urgent need in the establishment of well-structured and continuous monitoring methods to reduce the divesting effects of the urbanization conditions to rejoice the habitations. A systematic, focused conservation strategies need to be implemented by the government to save the species of birds and their sustainable population.

Table 1: A systematic list of birds with their status in Mydala wetland

Common name	Scientific name	Status
Order: Podicipediformes		
Family: Podicipitidae		
Little grebe	*Tachybaptusruficollis*	R
Order: Pelecaniformes		
Family:Pelecanidae		
Rosy or White Pelicans	*Pelecanusonocrotalus*	RM
Spotted billed Pelican	*Pelecanusphilippensis*	RM
Family: Phalacrocoracidae		
Little cormorant	Phalacrocoraxniger	RM
Great cormorent	Phalacrocoraxcarbo	RM
Family: Anhingidae		
Darter	Anhinga melamogaster	RM
Order: Ciconiiformes		
Family: Ardeidae		
Grey heron	Ardeacinerea	RM
Purple heron	Ardeapurpurea	RM
Pond heron	Ardealagrayii	R
Cattle egret	Bubulcus ibis	RM

Great egret	Casmerodiusalbus	RM
Median egret	Mesophoyxintermedia	RM
Little egret	Egrettagarzetta	R
Family: Ciconiidae		
Painted stork	Mycteria leucocephala	RM
Openbill stork	Anastomusoscitans	R
Family: Threskiornithidae		
Glossy ibis	Plegadisfalcinellus	RM
Black ibis	Pseudibispapillosa	R
Order: Anseriformes		
Family: Anatidae		
Lesser Whisteling teal	Dendrocygnajavanica	R
Pintail	Anasacuta	M
Commenteal	Anascrecca	RM
Spotbilled duck	Amaspoecilorhyncha	RM
Garganey	Anasquerquedula	M
Shoveller	Anasclypeata	M
Cotton teal	Nettapuscoromandlianus	R
Order : Falconiformes		
Family : Accipitridae		
Common Paridhkite	Milvusmigrans	R
Brahminy Kite	Halliasturindus	R
Sparrow Hawk	Accipiter nisus	R
King Vulture	Sarcogypscalvus	R
Order: Gruiformes		
Family: Rallidae		
Little crake	*Amaurornisakool*	R
White breasted water hen	*Amaurornisphoenicures*	R
Water cock	*Gallicrexcinerea*	RM
Indian morehen	*Gallinulachloropus*	R
Purple morehen	*Porphyria porphyrio*	RM
Coot	*Fulicaatra*	R
Order: Charadriiformes		
Family : Jacanidae		
Bronze winged Jacana	*Metopidicusindicus*	R
Family: Charadriidae		
Sub Family: Charadriinae		
Redwatteled lapwing	*Vanellusindicus*	R
Yellow wattle lapwing	*Vanellesmalabaricus*	M
Grey plover	*Pluvialissquatarola*	M
Little ringed plover	*Charadriusdubius*	M
Sub Family: Scolopacinae		
Common sand piper	*Tringahypoleucos*	RM
Marsh sand piper	*Tringastagnatilis*	M
Little Stint	*Calidrisminuta*	M
Curlew Sand piper	*Calidristestacea*	M
Family: Rostratulidae		
Painted snipe	*Rostratulabenghslensis*	R
Family: Recurvirostridae		
Black winged stilt	*Himantopushimantopus*	R
Family: Laridae		
Indian River Tern	*Sterna aurantia*	RM
Common Tern	*Sterna hirundo*	R
Order: Columbiformes		
Family: Columbidae		
Spotted Dove	*Streptopeliachinensis*	R
Order : Psittaciformes		
Family : Psittacidae		
Rose Ringed parakeet	*Psittaculakrameri*	R
Order : Cuculiformes		
Family : Cuculidae		

Koel	*Eudynamysscolopacea*	R
Crow Pheasant	*Centropussinensis*	R
Order : Apodiformes		
Family : Apodidae		
House Swift	*Apus affinis*	RM
Order: Coraciiformes		
Family:Alcedinidae		
White breasted kingfisher	*Halcion smyrnensis*	R
Small blue kingfisher	*Alcedoatthis*	R
Pied Kingfisher	*Cerylerudis*	R
Family: Meropidae		
Small green bee eater	*Meropsorientalis*	R
Order: Piciformes		
Family: Picidae		
Lesser Golden Backed Woodpecker	*Dinopiumbenghalense*	R
Order: Passeriformes		
Family : Hirundinidae		
Wire tailed Swallow	*Hirundosmithii*	RM
Family : Dicruridae		
Black drongo(King Crow)	*Dicrurusadsimilis*	R
Family : Sturnidae		
Indian Myna	*Acridotheres tristis*	R
Jungle Myna	*Acridotheres fuscus*	R
Family : Corvidae		
House crow	*Corvussplendens*	R
Family: Pycnonotidae		
Red whiskered bulbul	*Pycnonotusjocosus*	R
Family : Muscicapidae		
Sub Family: Timaliinae		
SpotedBabler	*Pellorneumruficeps*	R
Common Babler	*Turdoidescaudatus*	R
Sub Family : Turdinae		
Magpie robin	*Copsychussaularis*	R
Family : Motacillidae		
Large pied Wag tail	*Motacillamaderaspatnsis*	R
Yellow Wagtail	*Motacillaflava*	R
Grey Wagtail	*Motacillacinerea*	M
Paddy field pipet	*Antusrufulus*	R
Family : Ploceidae		
Sub family: Ploceinae		
Baya Weaver bird	*Ploceusphilippinus*	R

Table 2: Percentage occurrence in avifauna represented in orders

Sl. No.	Orders	No. of Families	No. of Species	Percentage Occurrence
1	Podicipodiformes	1	1	1.4
2	Pelecaniformes	3	5	7.04
3	Ciconiformes	3	11	15.49
4	Anseriformes	1	7	9.85
5	Falconiforms	1	4	5.6
6	Gruiformes	1	6	8.45
7	Charadriformes	5	13	18.3
8	Columbiformes	1	1	1.4
9	Psittaciformes	1	1	1.4
10	Cuculiformes	1	2	2.81
11	Apodiformes	1	1	1.4
12	Coraciiformes	2	4	5.6
13	Piciformes	1	1	1.4
14	Passiriforms	8	14	19.7

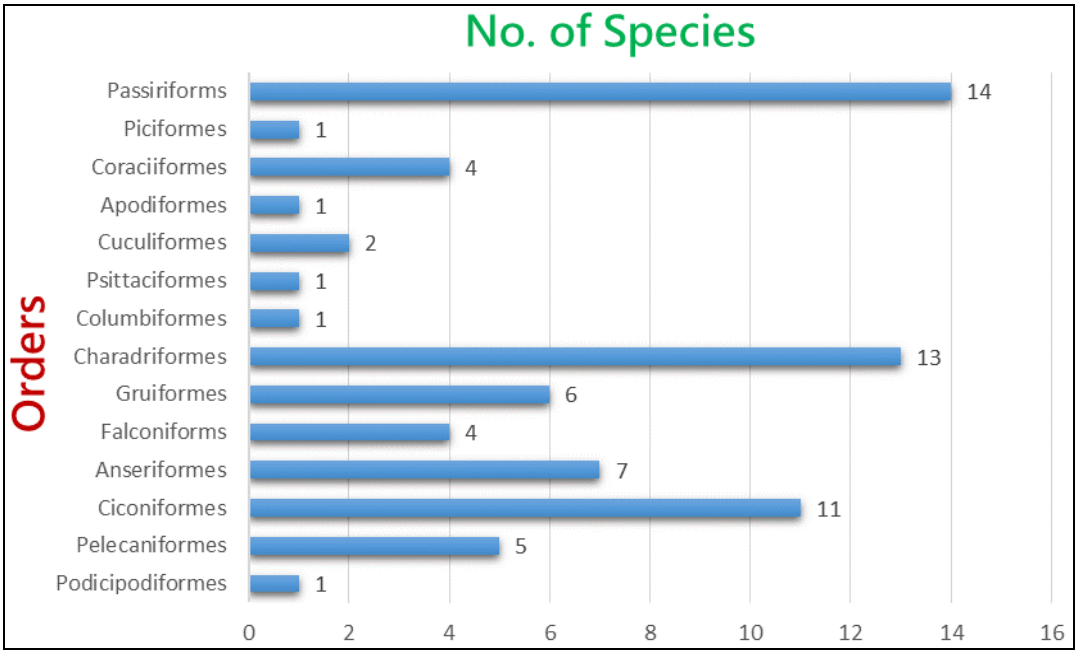

Fig: 1 Percentage occurrence in avifauna represented in families in Mydala wetland

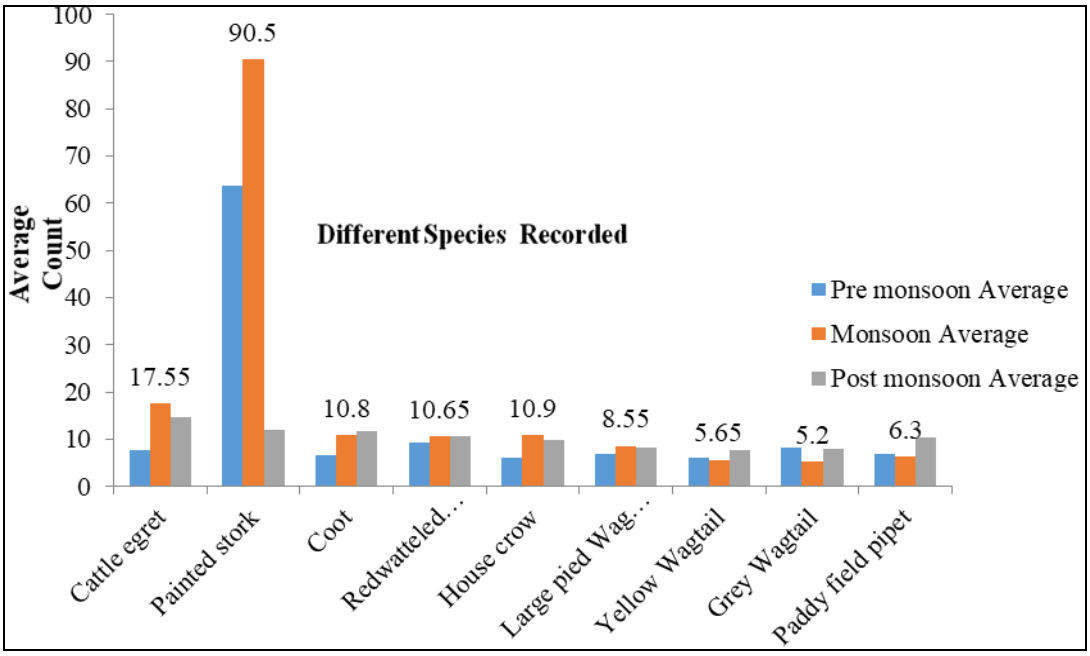

Fig: 2 Graph representing an average bird count (less than 91) at different seasons in Mydala wetland

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