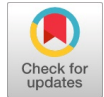


Study of Avian Biodiversity of Aquatic Bodies of Moradabad City, Uttar Pradesh, India



Shalini Gupta

Abstract: Biodiversity is the diverse variety of life on Earth, including all life forms and their interactions. Biodiversity is a key indicator of the health of an ecosystem. Rich Avian biodiversity are found in and around these aquatic bodies and wetlands around the world. They comprise resident, non resident and migratory birds. Moradabad city is surrounded by many wetlands and riverine systems and has diverse avian fauna. These birds provide structural and functional framework of the ecosystem and also share interaction with humans. Waterbirds, also known as aquatic birds, are adapted to living in or around water environments, including shores and wetlands. Within this group, some species are more terrestrial, classified as wading birds, while others are more aquatic, commonly referred to as waterfowl. These birds have evolved unique adaptations to thrive in their aquatic habitats. Their feeding habits vary, with some diving from the surface or air to catch prey in deep water, while others feed on the surface. Distinct physical features, such as webbed feet, long legs, pointed beaks, and clubbed beaks, facilitate their feeding and foraging behaviors. A survey of accessible water bodies and wetlands in Moradabad city revealed a diverse range of bird species across different seasons and time zones. Birds were spotted in various habitats, including wetlands, agricultural lands, river shores, ponds, water bodies, and even drainage and sewage systems. The observed bird populations ranged from solitary individuals to flocks of 20-25.

Keywords: Aquatic Avian Fauna, Moradabad City, Water Bodies, Conservation

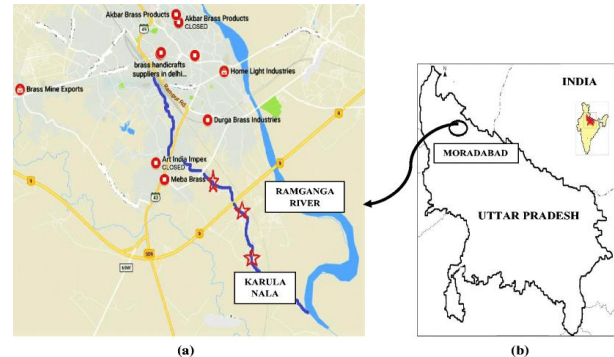
Abbreviations:

IUCN: International Union for Conservation of Nature

I. INTRODUCTION

Freshwater ecosystems are fragile environment, are rich in biodiversity and are believed to be at risk than other freshwater animals. To understand the mechanism, driving losses in aquatic biodiversity, is important to the conservation and restoration of freshwater environments worldwide [1].

Moradabad lies between 28 °21' to 28 °16' North Latitudes and 78 °4' to 79 ° East Longitude. This district of western Uttar Pradesh occupies a geographical area of 3493 sq. km [2]. Moradabad is famous worldwide for export of brass wares and artisan handicrafts (Fig-1).



[Fig.1: Map of Moradabad City, Uttar Pradesh][2]

Moradabad is well surrounded by riverine systems (Ramganga River, Gagan river, Dhela River, Kosi) and has multiple wetlands with a long stretch of shoreline around Ramganga River [3] (Fig-2).



[Fig.2: River System of Moradabad]

A water bird, alternatively waterbird or aquatic bird, is a bird that lives on or around water, in shores. Some water birds are more terrestrial and are known as Wading birds while others are more aquatic and are commonly called as waterfowls. They are adapted to their habitat and environment where they live. They are well adapted to feed in the water which may be deep or they may be surface feeder. Their body is well adapted for feeding e.g the ability to dive from the surface or the air to catch prey in water. The features of webbed feet, long and thin legs, pointed beak, clubbed beaks etc aids in their feeding and catching prey.

Diverse Avian Fauna are found in these aquatic bodies and shores These birds may be resident, non resident inhabitant or migratory [4]. Many migratory birds also visit these wetlands during their course of migration. These birds feed on small aquatic insects and crustaceans. According to literature surveyed Indian Wetlands and coastlines support around 210 species of wading birds. Waders are ecologically dependent on water bodies and wetlands for their feeding and breeding. These birds help in maintaining the

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nutrient flow through the food chain and food web, seed dispersal. There are many beautiful birds which add beauty to the habitat where they live. These birds also have economic value as they are also used as food [5]. The present study reports on the diversity of aquatic birds in Moradabad and nearby areas, following a 24-month survey (2023-2025).

II. MATERIALS AND METHODS

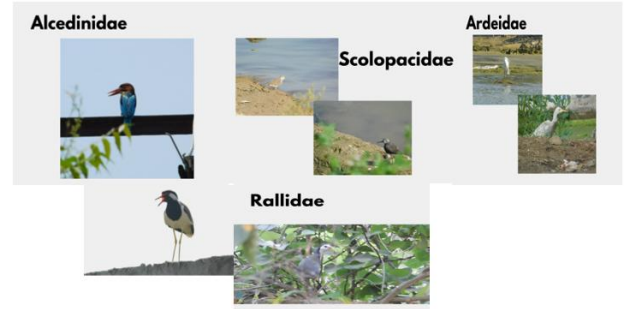
Observations of Biodiversity of Avian fauna of Wetlands of Moradabad city were made with the aid of binoculars and data was recorded along with photography using DSLR cameras during 2023-25. The birds were identified using standard field guide books of Ali & Ripley [6], Salim Ali and a checklist of different apps were also used.

III. RESULT AND DISCUSSIONS

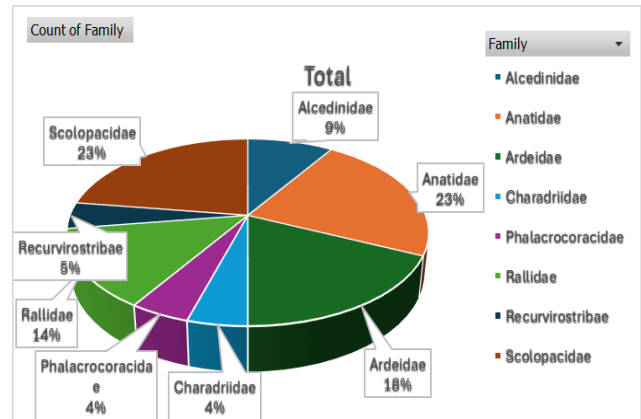
Approachable areas of water bodies and wetlands of Moradabad city were visited for finding different birds in different seasons and time zone. Birds were found in wetlands, agricultural lands, river shores, ponds, water bodies and even in drainage and sewage systems [7]. These birds were found in quiet numbers ranging from one to flock of 20-25 [Fig. 3 (Plate: 1-5)]. These birds belong to different families and diverse orders [8] (Table-I).

Table-I: Showing Major Aquatics Birds of Water Bodies of Moradabad, UP, (2023-2025)

Sr. No.	Name of Wader	Zoological Name	IUC N	Family
1	Black Winged Stilt	Himantopus	LC	Recurvirostri bae
2	Cattle Egret	Bubulcus ibis	LC	Ardeidae
3	Common Kingfisher	Alcedo atthis	LC	Alcedinidae
4	Common Moorhen	Gallinula chloropus	LC	Rallidae
5	Common redshank	Tringa totanus	LC	Scolopacidae
6	Common Sandpiper	Actitis hypoleucos	LC	Scolopacidae
7	Common Snipe	Gallinago gallinago	LC	Scolopacidae
8	Greylag goose	Anser anser	LC	Anatidae
9	Indian Pond Heron	Ardeola grayii	LC	Ardeidae
10	Indian Spot Billed Duck	Anas poecilorhyncha	LC	Anatidae
11	Eurasian Moorhen	Gallinula Cholopus	LC	Rallidae
12	LESSER Whistling Duck	Dendrocygna javanica	LC	Anatidae
13	Little Egret	Egretta garzetta	LC	Ardeidae
14	Little stint	Calidris minuta	LC	Scolopacidae
15	Little/Indian Cormorant	Microcarbo niger	LC	Phalacrocoracidae
16	Mallard or wild duck	Anas platyrhynchos	LC	Anatidae
17	Muscovy Duck	Cairina moschata	LC	Anatidae
18	Red Wattled Lapwing	Vanellus Indicus	LC	Charadriidae
19	Western Egret	Ardear Ibis	LC	Ardeidae
20	White Breasted Waterhen	Amouornis Phoenicurus	LC	Rallidae
21	White Throated Kingfisher	Halcyon smyrnensis	LC	Alcedinidae
22	Wood Sandpiper	Tringa glareola	LC	Scolopacidae



[Fig.3: Plate 1. Kingfisher; Plate 2. Lapwing; Plate 3. Waterhen; Plate 4. Egrets; Plate 5. Sandpiper]



[Fig.4: Pie Chart Showing the Aquatic Avian Species of Different Families]

The pie chart (Fig-4) illustrates the diversity of avifauna in the wetlands of Moradabad, with 22 bird species representing 8 families recorded from various sites [9]. Notably, the families Scolopacidae and Anatidae exhibited the highest species richness, indicating their adaptability and abundance in these wetland ecosystems [10].

In contrast, the families Phalacrocoracidae and Charadriidae were represented by the fewest species, highlighting the need for targeted conservation efforts to protect these lesser-represented groups [11].

Although the recorded bird species are currently classified as Least Concern on the International Union for Conservation of Nature (IUCN) Red List, it is essential to recognize the importance of maintaining and conserving these wetland habitats to ensure the long-term survival and well-being of these avifaunal populations [12].

From perusal of literature, it was found that no such prior records of aquatic birds of Moradabad city had been earlier reviewed. So this data may be helpful for making Avibase data of Aquatic Birds of Moradabad City.

IV. CONCLUSION

A variety of birds were seen in the urban localities of Moradabad (U.P). Due to food availability, many species are found round the year like Maina, Ferals, Kites, Pigeons, Crows and Sparrows. Some birds, which are seen in less numbers are hornbills, and barbets in congested and overpopulated areas than in greeneries of the city. Species of Order Passeriformes are abundantly found as compared to others. Bird diversity and abundance are



greatly impacted by environmental changes brought about by human activities like urbanization, habitat fragmentation, human disturbance, construction of new colonies and roads, deforestation, and industrialization. As compared to data reported by e-birds in Moradabad, 105 birds have been reported. The relative abundance of birds found in urban localities was less as compared to the outskirts and rural places of the city. Some ways to improve urban bird habitats include- Increasing green areas, improving landscape connectivity, and increasing water sources and greenery in urban buildings.

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DECLARATION STATEMENT

I must verify the accuracy of the following information as the article's author.

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- **Funding Support:** This article has not been sponsored or funded by any organization or agency. The independence of this research is a crucial factor in affirming its impartiality, as it has been conducted without any external sway.
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- **Data Access Statement and Material Availability:** The adequate resources of this article are publicly accessible.
- **Authors Contributions:** The authorship of this article is contributed solely.

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