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Avian Fauna Diversity of Lungh Lake Sanctuary Sindh, Pakistan

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Abstract
The full-flowered Lungh Lake Sanctuary is known for its diverse range of birds. According to the current study, many bird species can be found in wetlands. Although we learned about a wide range of bird species there, 53 distinct bird species were identified during fieldwork. These birds were divided into 10 families, including the Ardeidae, Rallidae, Charadridae, Alcedinidae, Sturnidae, Muscicapidae, Columbidae, Cuculidae, Anatidae, Recurvirostridae, and Passeridae. The Charadridae and Sturnidae were smaller in number, whereas the Anatidae were a large family with fame. It was observed that some of the families were residents and that many were tourists. Except for the Passeridae and Columbidae families, these species mainly depend on water. Some of the birds included in this study were insects and grain eaters, but most of the birds subjected to this study were fish eaters.

Keywords: Diversity, Strip-transect method, Wetland birds, Abundance, Order, Sindh.

Introduction

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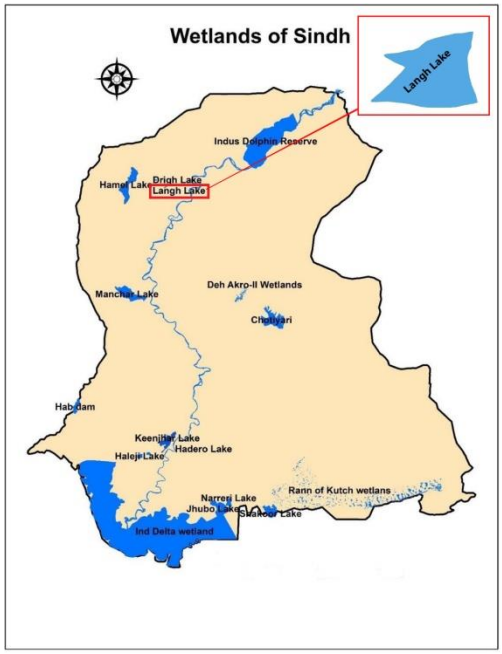
The Lungh Lake Sanctuary is a vital wetland at 68° 21' E and 27° 56' N. The Qambar Shadkot district is where it is to be established. Bird species thrive in this marsh, which also has a pleasant setting for bird visitors. Every year, it attracts tourists; according to Northern Sindh, it is the best wetland in the area (Ali, Salim 1996). Three distinct regions comprise the lake's environment: the open water with Typha and Juncus along the edge, the marshy area where Tamarix grows, and the adjacent rice fields where significant Juncus species are found. Bird variety, which depends on the lake, is protected by this wetland daily and seasonally. There were many different kinds of birds in the marshes. Mehrban Ali Brohi, "Zoological Survey," 2017 The exceptional economic value of wetland ecosystems results from public demand and confidence. Wetlands International (2007) states each region provides essential habitat for water birds migrating along the Central Asian Flyway and preserves a distinguished avian variety. There are 53 species of birds in 10 families. Many water birds, including mallards, graylag geese, pochards, and Eurasian coots, migrate through Lungh Lake for food throughout the winter.

Additionally, it is intended to supply vital bird data for upcoming studies on the avifauna in wildlife wetlands sanctuaries. There are over 70,000 bird wetland habitats, and Lunch Lake is the best location to provide all the necessities for birds. Research on the birds of Lungh Lake Sanctuary must be conducted with full awareness of resident and visitor species. It was well known that the variety of birds in Lungh Lake changed as the surroundings changed.

Materials And Methods

The Lungh Lake Sanctuary is a swampy wetland that is primarily vegetated. Langh sits between 50 and 115 meters above sea level, with an average annual rainfall of 70 mm and a usual temperature of 39.0°C. Three sites—Site I, Site II, and Site III—were separated by the Lungh Lake. This swamp was traversed four times in one month and once per week. Studying avian species was the primary goal. Two transect methods were used for bird counting: strip transects and point counts. In 1992, Colin et al.

Additionally, two cameras (Olympus 8-16 X 40, DPS I) were set up to observe birds at the study location to identify their avifauna. Sonobe and Usui (1993) and Birds of Pakistan (Grimmett et al., 2009) were referenced for the classification of water birds. All resident and visitor bird species were separated.



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Results and Discussion

Throughout the study period, 53 species of birds were identified and classified into 10 families: Sturnidae, Ardeidae, Rallidae, Muscicapidae, Charadridae, Columbidae, Cuculidae, Anatidae, Passeridae, and Recurvirostridae (Table 1). The Anatidae family of birds is classified as having loose-feather aquatic birds that range in size from intermediate to large, have a slim body, an extended collar, and a typically long and pointed beak. The lower tibiae bone is naked, and the web between the outer and middle regions is incomplete. In search of fish, insects, and infrequently frogs, small animals, and even young birds, they frequently appear in marsh water across the globe. The vast number of species in this family is 16.98%. The large, worldwide family of small- to medium-sized aquatic and terrestrial birds is called the Rallidae. The family has many appearances and includes ubiquitous species like coots, crakes, and gallinules, while other rail species are extremely rare or endangered. Charadridae are small to medium-sized birds with black stripes on their bodies, short, thick necks, and long, usually pointed wings. This family also presents at the lake in 5.66%. Commonly found in many wetlands, the Sturnidae family of singing birds includes mynahs and starlings. They are also rather aggressive birds. They have long, pointed wings, a small, curved beak, and strong legs and feet. Starlings are characterized by their dull coloring; some have wattles or bare patches of skin, and some have crested heads.

Additionally, 5.66% of this family shows up at the lake. Singing birds, such as the Muscicapidae, are little passerine birds. They have short legs, short, rounded wings, and a flat beak. Insectivores are often tiny birds. With 13.21% of all species in Lungh Lake, Muscicapidae is the largest group. Members of the Columbidae family are robust birds with short, slender beaks and collars. Their primary food source is plants, classified as granivores, which mainly consume seeds. The Lungh Lake has 9.43% of this family as well. Typically, medium-sized, slender birds and cuckoos belong to the Cuculidae family. Most species live in trees. The family is widely distributed; tropical regions are home to the best species. Visitors include certain species. In addition to a wide range of other creatures, the cuckoos consume insects and their larvae. This family, which contains an equal number of species and 9.43% of all species, includes some brood parasites.

In contrast, the Anatidae family of birds, which includes swans, ducks, and geese, are tiny to large birds with a broad, stretched body plan. The short, pointed forelimbs are supported by powerful wing muscles that beat quickly in flight. They typically have long necks Set well to the rear of the body; the hindlimbs are tiny, powerful, and have a peeling, fibrous texture. In addition to their body form, certain species are awkward on land, yet they can walk more forcefully than other aquatic and marine birds like petrels or grebes. Usually, their feet are webbed. The Ardeidae family is the next largest, with 13.21% of the total species. The family Recurvirostridae has long, thin necks, bills, and

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legs. In the brackish or salty marshes where the bird prefers to feed, its upward-curved bills are swept from side to side.

In contrast, the stilts' bills are straight. Avocets and the banded stilt, which swim more, have fully webbed front toes, while other stilts only have half-webbed front toes. While most species have contrasting black and white patches on their feathers, others have brown or buff patches on their heads or chests. The sexes are comparable. The number of species in the Recurvirostridae family is 7.55% of all species. The Passeridae family Typically, sparrows are plump, tiny, brown-grey birds with strong, stubby beaks. There can be subtle distinctions between species of sparrows. Except for an additional bone in the mouth and a vestigial dorsal outer primary feather, sparrows resemble other seed-eating birds, including finches, in appearance. In 7.55% of cases, this family is also found in Lungh Lake. These families were all grouped according to their preferred environment and feeding mode. According to the study, 50% of the species testified were residents, 35% were winter visitors, and 5% were summer migrants. The next largest group of species, comprising 13.21%, is Muscicapidae and Ardeidae.

According to their preferred foods, all avifauna species are divided into six groups in the current study. Of them, 99 were insectivorous, 27 were piscivorous, 26 were omnivorous, 21 were frugivorous, 20 were grainivorous, 17 were carnivorous, and eight were nectarivorous. Fig. 3 shows the percentage composition of birds that lived in Site I and Site II in the study region during the study period. It was observed that 66.21% of the birds were present at Site I, 33.79% at Site II, and 33.79% at Site III. It is evident that Site I is the birds' favorite. In the research area, there are typically more species in January, February, and March and fewer in May, June, and July. January saw the greatest number of confirmed specimens, while July saw the lowest number.

Table 1 shows the monthly collection of bird species and their relative abundance in the study area. Table 2 provides a list of the 53 bird species that were referenced in this study. According to the survey, the lake's natural features allowed the birds to survive all year round.

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Family	Common name	Scientific name	Status	Diet
Ardeidae,	Purple heron	*Ardea purpurea*	M	P
	Grey heron	*Ardea cinerea*	R/M	P
	Little green heron	*Ardeola striatus*	R/M	P
	Pond heron	*Ardeola grayii*	M	P
	Cattle egret	*Bubulcus ibis*	M	P
	Median egret	*Egretta intermedia*	R	P
	Little egret	*Egretta garzetta*	R	P
Rallidae	White breasted waterhen Purple moorhen	*Amaurornis phoenicurus*	M	P
		Porphyrio porphyrio	M	P
	Water rail	*Rallusa quaticus*	M	P
	Baillon's crake	*Porzana pusilla*	M	P
	Common moorhen	*Gallinula chloropus*	R	P
	Grey-headed Swamphen	*Porphyrio poliocephalus*	R	
Charadridae	Red wattled lapwing	*Vanellus indicus*	*R*	P
	Common sandpiper	*Tringa hypoleucos* –	*R*	P
	Little ringed plover	*Charadrius dubius*	*R*	P
Sturnidae	common myna	*Acridotheres tristis*	*R*	I
	Jungle crow	*Corvus macrorhynchos*	*R*	O
	Tree pie	*Dedrocitta vagabunda*	*R*	I
Muscicapidae	Magpie-robin	*Copsychus saularis*	*M*	I
	Pied bushchat	*Saxicola caprata*	*M*	I
	Common stonechat	*Saxicola torquata*	*R/m*	P
	Plumbeous water redstart	*Rhyacornis fuliginosa*	*M*	P
	White-tailed rubythroat	*Lucinia pectoralis*	*R*	I
	Red Throated	*Flycatcher Ficedula parva*	*R*	G
	Rufous tailed Scrub Robin	*Cercotrichas galactotes*	*R*	G
Columbidae	Eurasian collared dove	*Strepto peliadecaocta*	*M*	G
	Oriental turtle dove	*Strepto peliaorientalis*	*M*	G
	Blue rock pigeon	*Columba livia*	*R*	G
	Spotted dove	*Streptopelia chinensis.*	*R*	G
	Yellow Footed Green Pigeon	*Treron phoenicoptera*	*R*	G
Cuculidae	Koel	*Eudynamys scolopacea*	*R*	G
	Crow-pheasant	*Centropus sinensis*	*R*	O
	Eurasian cuckoo	*Cuculus canorus*	*M*	G
	Himalayan cuckoo	*Cuculus saturatus*	*M*	I
	Lesser cuckoo	*Cuculus poliocephalus*	*M*	I
Anatidae	Tree duck	*Dendrocygna javanica*	*M*	P
	Common teal	*Anas crecca*	*M*	P
	Cotton teal	*Nettapus coromandelianus*	*M*	P
	White-faced whistling duck	*Dendrocygna viduata*	*M*	P
	Fulvous whistling duck	*Dendrocygna bicolor*	*M*	P
	Canada goose	*Branta canadensis*	*R*	P
	Black swan	*Cygnus atratus*	*R*	P
	Eurasian Wigeon	*Mareca Penelope*	*R*	P
	Ferruginous duck	*Aythya nyroca*	*M*	P
Recurvirostridae	Black winged stilt	*Himantopus himantopus*	*R*	P
	Pied Stilt	*Himantopus leucocephalus*	*R*	P
	Black-necked Stilt	*Himantopus mexicanus*	*M*	P
	White-backed Stilt	*Himantopus melanurus*	*M*	P

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Passeridae	Chestnut Shuoldered Petronia	*Petronia xanthocollis*	*M*	I
	Spanish Sparrow	*Passer hispaniolensis*	*M*	I
	Black Redstart	*Phoenicurus phoenicurus*	*M*	I
	House Sparow	*Passer domesticus*	*R*	I

M, Migratory. R, Resident. R/M Rare migratory P, Piscivores. I, Insectivores. O, Omnivores. G, Granivores

Sr.No.	Family	No of species	Percent occurrence
1	Ardeidae,	07	13.21
2	Rallidae	06	11.32
3	Charadridae	03	5.66
4	Sturnidae	03	5.66
5	Muscicapidae	07	13.21
6	Columbidae	05	9.43
7	Cuculidae	05	9.43
8	Anatidae	09	16.98
9	Recurvirostridae	04	7.55
10	Passeridae	04	7.55

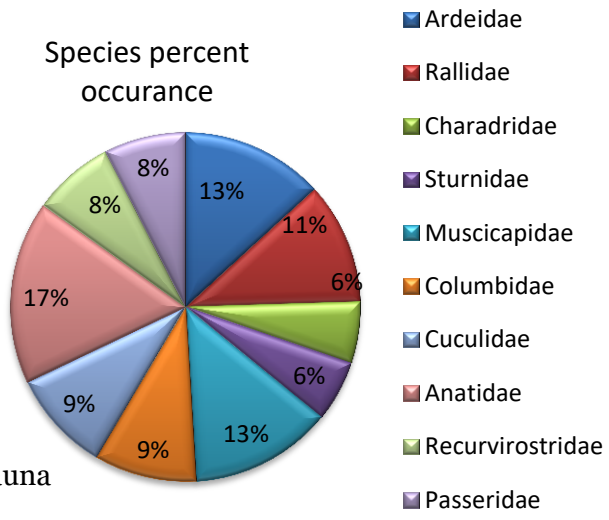
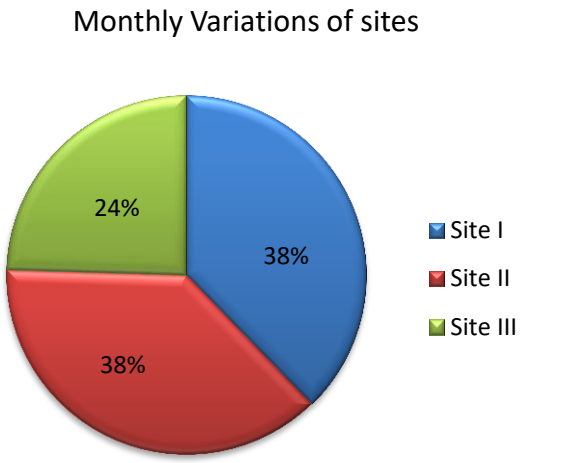


Table - 2: Monthly fluctuation in the diversity of avifauna

Months	Site I	Site II	Site III
Sep	02	01	00
Oct	01	01	01
Nov	03	02	02
Dec	05	04	03
Jan	02	04	04
Feb	02	02	01
Mar	01	01	01
Apr	01	01	00
May	01	00	01
June	01	01	00
July	00	01	00
Aug	01	02	00



Conclusion

The Langh Lake bird collection noted monthly fluctuations. The lake's bird population was observed from March to September. Using taxonomic classification, bird species

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were separated into three groups: migratory, resident, and preferred diet. The local species are occupied with nesting while the migrating birds leave the area.

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