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AVIAN FAUNA AND PHYSICO-CHEMICAL PARAMETERS OF GAJARGAON POND OF AJARA TAHSIL, KOLHAPUR (M. S.)

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ABSTRACT

The present investigation reveals avian fauna and physico-chemical parameters of Gajargaon pond, Maharashtra. Twenty two different species of birds have been cited belonging to 9 orders and 14 families during the year 2011. Water parameters like temperature, transparency, free CO_2, pH, EC, alkalinity, hardness, chloride, DO., and BOD were analyzed and found variations throughout the year. In the present study the total alkalinity and BOD were found very low. From the results it has been observed that the pond water is suitable for the growth of different biological parameters like algae, planktons, insect larva, fishes, molluscans etc. which ultimately attract birds towards pond and adjoining area.

Key words: Avian fauna, Fresh Water, Physico –chemical properties, Water Quality.

INTRODUCTION

Water is a basic and primary need of all vital processes and it is now well established that the life first arose in aquatic environment. Ever since the pre-historic times man has been intimately associated with water and it has been continuously proved by the evidences of past civilization that all historic human settlements were around inland freshwater resources. These wetlands are traditional zones that occupy intermediate position between dry land and open water[1]. These wetlands are rich in flora and fauna and birds are one of the important biotic factors which prefer to live near these wetlands.

Gajargaon pond ($16^0$13'13" N, $74^0$21'01"E) is one of the small natural, perennial wetland situated in Gajargaon village in Ajara tahsil of Kolhapur District, Maharashtra. It occupies 0.8 ha area, receiving an annual rainfall of about 700mm and rich in biodiversity. The population of Gajargaon is 4,500 and people depending upon this pond for their domestic needs like cloth washing, domestic animal drinking and washing purpose.

EXPERIMENTAL

Survey of Birds

Different species of birds have been cited through visual survey method by using Canon 7×40 power, field binocular. Birds were identified with the help of standard literature and field guides on the basis of their special features [2, 3, 4].Photographs of different bird species were taken by using Canon EOS 600 D camera with 18-55 mm and 55-250 mm lenses for confirmation of species.

Collection of samples

The samples of surface water were collected monthly from Gajagaon Pond during January 2011 to December 2011. The samples were collected in plastic container in the morning hours and brought to the laboratory for further analysis.

Analysis of physico-chemical properties

For the analysis, the standard methods were used. Some parameters like Temperature, pH, Transparency was done at the investigation sites. The sample for DO was fixed in the BOD bottle at the sites and then

brought to the Laboratory for analysis. Winkler's method was followed for this analysis, while remaining analysis was made by the standard methods of APHA[5] and Trivedy and Goel[6].

RESULTS AND DISCUSSION

During the period of study twenty two species of birds have been recorded in the Gajargaon pond, which are belonging to 8 orders and 14 families. 6 species belonged to Passeriformes, 4 belonged to Pelecaniformes, 3 belonged to Coraciformes, 2 belonged to Charadriiformes, 2 belonged to Cicconiformes, 2 belonged to Gruiformes, 1 belonged to Accipitriformes, 1 belonged to Galliformes and 1 belonged to Podicipediformes (Table-1).

Table-1: List of bird species in and around Gajargaon pond according to their taxonomical group

S. No.	Common Name	Scientific Name	Order	Family
1	Common Kingfisher	*Alcedo atthis*	Coraciiformes	Alcedinidae
2	White breasted waterhen	*Amaurornis Pheonucurus*	Gruiformes	Rallidae
3	Indian Pond Heron	*Ardeola grayii*	Pelecaniformes	Ardeidae
4	Cattle Egret	*Bulbulcus ibis*	Pelecaniformes	Ardeidae
5	Oriental Magpie Robin	*Copsychus saularis*	Passeriformes	Muscicapidae
6	House Crow	*Corvus splendens*	Passeriformes	Corvidae
7	Intermediate Egret	*Egretta intermedia*	Pelecaniformes	Ardeidae
8	Black winged Kite	*Elanus caeruleus*	Accipitriformes	Accipitridae
9	White breasted Kingfisher	*Halcyon smymensis*	Coraciiformes	Halcyonidae
10	Long tailed Shrike	*Lanius schach*	Passeriformes	Laniidae
11	Yellow Wagtail	*Motacilla flava*	Passeriformes	Motacillidae
12	White browed Wagtail	*Motacilla moderaspatensis*	Passeriformes	Motacillidae
13	House Sparrow	*Passer domesticus*	Passeriformes	Passeridae
14	Jungle Bush Quail	*Perdicula asiatica*	Galiiformes	Phasianidae
15	Little Carmorant	*Phalacrocorax niger*	Pelecaniformes	Phalacrocoracidae
16	Little Greeb	*Tachybaptus ruficollis*	Podicipediformes	Podicipedidae
17	Red wattled Lapwing	*Vanellus indicus*	Charadriiformes	Charadriidae
18	Yellow wattled Lapwing	*Vanellus malbaricus*	Charadriiformes	Charadriidae
19	Pied Kingfisher	*Ceryle rudis*	Coraciiformes	Alcedinidae
20	Pond Heron	*Ardeola grayii*	Ciconiformes	Ardeidae
21	Night Heron	*Nycticorax nycticorax*	Ciconiiformes	Ardeidae
22	Purple Moorhen	*Porphyrio porphyrio*	Guiformes	Rallidae

Among these few are migratory where as others are native. The water birds are specific in their choice of wetlands. This often strongly associated with prey distribution and abundance[7]. Water birds mainly feed on benthic invertebrates[8] which shows wide variations in the density and diversity between seasons and hence the variations in the prey population dynamics should influence the bird populations

Physico-chemical parameters of Gajargaon pond in Table No. 2 show monthly variations from January 2011 to December 2011. The air temperature ranges from 16^0 C to 25^0 C. Water temperature ranges from 13^0 C to 22^0 C. Both air temperature and water temperature are important which determines the distribution of different life forms. In this study it has been found that air and water temperatures go more or less parallel, proving the fact that the atmospheric temperature governs water temperature[9, 10].

The transparency ranges between 16 cm to 32 cm. the minimum transparency was recorded in the month of August while maximum in the month of November and December. The transparency was higher during winter season due to absence of rainfall, runoff and flood water as well as gradual settling of suspended particles[11].

The pH values ranges from 6.7 to 7.9. It was minimum in the month of July, August and maximum in the month of May. Krishna Ram H. *et. al.* showed similar range of pH[12]. Higher values were recorded during

summer which may be due to high growth rate of algal population which utilizes CO_2 through photosynthetic activity[13].

Table-2: Physico-chemical parameters of Gajargaon Pond.

Month/ Parameter	Air Temp	Water Temp	Transpar-ency	Free CO_2	pH	EC	Alkali-nity	Hardness			Chloride	D.O.	B.O.D.
								Total	Ca	Mg			
Jan	16^0C	13^0C	23	4.4	6.8	0.33	24	70	12.03	14.08	42.60	7	1.6
Feb	22^0C	19^0C	22	4.4	7.1	0.40	30	86	28.01	14.07	65.32	5	1.2
March	25^0C	22^0C	22	8.8	7.2	0.45	32	90	26.07	15.04	76.58	4	0.8
April	24^0C	21^0C	21	8.8	7.5	0.50	54	120	32.08	21.36	142	4	1.6
May	20^0C	18^0C	19	8.8	7.9	0.55	50	120	32.08	21.36	142	4	1.2
June	20^0C	18^0C	18	8.8	7.3	0.44	44	100	24.86	18.25	85.20	5	1.6
July	19^0C	17^0C	17	4.4	6.7	0.20	28	54	13.63	09.80	31.24	5	1.6
August	20^0C	18^0C	16	4.4	6.7	0.23	30	60	16.04	10.68	31.24	6	2.0
Sept	21^0C	19^0C	17	4.4	7.5	0.19	34	50	14.43	08.64	39.76	6	1.2
Oct	21^0C	19^0C	29	4.4	7.6	0.11	18	42	18.13	06.50	45.40	7	1.6
Nov	20^0C	18^0C	32	8.8	7.2	0.11	20	66	16.84	11.94	51.12	8	2.0
Dec	23^0C	21^0C	32	8.8	7.7	0.28	22	70	12.03	14.08	56.80	8	3.6

Note: All values are in mg/lit. except temperature (^{0}C), transparency (cm), pH and E.C(mhos)

The electrical conductivity values ranges between 0.11 to 0.5 mhos. Minimum E. C. was recorded in the month of October and November while maximum during April and May. Higher values recorded during summer months may due to the accumulation of ions owing to evaporation, biological turnover and interaction with sediments. These findings are in agreement with statement given by Payne[14].

The free CO_2 concentration ranges from 4.4mg/liter to 8.8 mg/liter. The values don't show much variation throughout the year. Hujare has given similar range for Atigre tank from Maharashtra[15].

The total hardness value ranges from 42 mg/liter to 120 mg/liter. It was minimum in the month of October and maximum in the month of April and May. Synudeen Sahib has recorded similar range of total hardness showing higher in summer and lower in rainy season[16]. Calcium ion concentration values ranges between 12.03 mg/liter to 32.08 mg/liter. The calcium was minimum during November and maximum during April and May. Hulyal *et. al.* has given similar findings from Almatti reservoir, Karnataka and recorded maximum during summer[17].

Magnesium ion concentration ranges from 6.5 mg/l to 21.75 mg/l. Magnesium is often associated with calcium in all kinds of water but its concentration remains generally lower than the calcium[18].

The total alkalinity values range between 18 mg/l and 54 mg/l. it was minimum in the month of October while maximum during April and May. According to Jackson, alkalinity below 50 mg/l indicates low photosynthetic rate[19].

The chloride values range between 31.24 mg/liter and 142 mg/liter. It was minimum in the month of July and August while maximum during April and May. Nikam *et. al*. reported similar values of chloride from Jangamahatti Dam, Maharashtra[20]. High Chloride value may be due to organic wastes of animal origin and domestic washes. The higher values of chlorides during summer months may be associated with reduced water level. Dissolved oxygen values range between 4 mg/l to 8 mg/l being minimum during summer months and maximum during winter months. The main source of DO is from atmosphere and by photosynthesis through aquatic flora. Similar trend is shown by Ohal *et. al*. from Ganesh tank, Miraj, Maharashtra[21].

Biological Oxygen Demand value ranges between 0.8 mg/l to 3.6 mg/l. Sayeswar *et. al*. shown nearby values in present investigation[22]. The low BOD which indicates the lowest level of biodegradable material.

CONCLUSION

Through the present investigation it has been concluded that the all physico-chemical parameters were found to be enhance the quality of water which support the biotic factors like Phytoplankton,

Zooplanktons, invertebrates etc. and ultimately attract different species of birds towards wetland and found to be developing a good ecosystem.

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