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WATER QUALITY OF PAINTED STORK FORAGING TANK NEAR VEERAPURAM HERONRY, CHILAMATHUR (M) ANDHRA PRADESH

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ABSTRACT

Painted Storks, *Mycterialeucocephala* have been visiting Veerapuram for nearly hundred years with intermittent breaks. The main reason for non arrival of storks was due to lack of availability of food. These birds mainly feed on fish which are available in the tanks near the heronry. In the present study assessment of water quality of Lakshmipuram tank, which is a foraging place for these storks, was made to know the impact of different parameters on fish growth and health.

Keywords: *Painted Stork, Veerapuram heronry, Water Quality, Lakshmipuram tank.*

No. of Tables: 3 **No. ofReferences:7**

INTRODUCTION

In most developing countries there is lack of good hygiene practices and as such water bodies are contaminated through washing of clothes, domestic waste disposal, raw excreta etc.,. Water quality plays a significant role on life and activities of aquatic organisms. Environmental factors such as temperature, dissolved oxygen, light penetration, turbidity, density, etc., are responsible for distribution of organisms in different freshwater habitats according to their adaptations, which allow them to survive in that specific habitat (Jaffries and Mills, 1990). Few ponds/ lakes/ tanks have been assessed of their water quality in Andhra Pradesh(Tilak and Yallamma, 2013: Tirupathaiah et al., 2012). There is a need to continuously assess the quality of water sources.Hence we evaluated physico-chemical parameters of Lakshmipuram tank where Painted Stork forage for fish during their stay at Veerapuram heronry.

MATERIALS AND METHODS

Water samples were collected from Lakshmipuram tank during second week at monthly interval for a period of two consecutive years from Dec 2010-11 to 2011-12 and from 2013-14 for the analysis of physico-chemical parameters. Water samples were collected in acid washed 10 liters polythene containers below the depth of 5- 10 centimeters and collection was usually completed during morning hours between 08 AM and 10 AM for the analysis of color, odor, temperature, pH, conductivity, total dissolved solids (TDS), total hardness, dissolved oxygen (DO) and free carbon dioxide (CO_2).

RESULTS AND DISCUSSION

The data on different physico-chemical parameters of Lakshmipuram tank during 2010-2011, 2011-2012 and 2013-2014 are depicted Tables 1-3. The colour of water was found to be brown from December to July and green from August to November; the odor of water was like the odor of ammonia from December to June and fish odour from July to November. This could be due to more of Phytoplankton and onset of spawning by fish. Higher temperature observed during March, April and May could be due to greater solar radiation, low water levels observed. Clear atmosphere and higher atmospheric temperature. These results are supported by investigation of Harney et al., (2013) in Pindavani pond of Central India.

One of the important factors that serve as an index for pollution is pH. Alkaline pH noticed could be due to presence of carbonates, bicarbonates and also result of various biological activities. Conductivity, another parameter measured is an indirect measure of the presence of ionic dissolved solids such as Chlorides, Nitrates, Sulphates, Phosphates, Sodium, Magnesium, Calcium and Iron. These conduct electricity because they are negatively or positively charged when dissolved in water. The high value of conductivity in the month of August/ September might be due to high organic residue in the water body. Total hardness is commonly defined as the sum of polyvalent cations dissolved in water. The most common cations are calcium and magnesium; although iron and magnesium may contribute to hardness. The portions of dissolved solids in water have carbonates, bicarbonates, sulphates and chlorides of

sodium and calcium contentwhich could be contributing to high levels observed Shrivastava*et al*., 2013 reported similar trends in Village ponds of Chhattisgarh, India.

Measurement of DO is a primary parameter in all pollution studies and its permissible limit is 4-6 ppm. Concentration of dissolved oxygen indicates water quality and its relation to the distribution and abundance of various algal species (Moundiotiya *et al*., 2004). Free CO_2 dissolved in water is essentially the only source of carbon that can be assimilated and incorporated into the skeleton of living matter of all the aquatic autotrophy. Trend of free CO_2 observed could be related to the high rate of decomposition in the warmer months. This trend was also observed by Manjare *et al*., 2010.Observation made in the present study with regard Water quality of Lakshmipuram tank is not alarming.

Table 1:*Physico - Chemical parameters of water sample collected from Lakshmipuram tank during 2010 – 2011. Values are Mean ± S.D (N=6).*

S. No.	Parameters	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	IS: 10500 Desirable Limit
1	Color	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Green	Green	Green	Green	-
2	Odour	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Fish odour	Fish odour	Fish odour	Fish odour	Fish odour	Odour less
3	Temperature (° C)	29.0±0.00	29.5±0.00	28.0±0.00	27.0±0.00	26.5±0.00	30.0±0.00	25.0±0.00	24.0 ±0.00	24.5 ±0.00	26.5 ±0.00	29.0 ±0.00	26.0 ± 0.00	No value
4	pH	9.42±0.18	9.01±0.21	9.32±0.33	9.26±0.17	9.51±0.19	8.90±0.16	9.31±0.20	9.18 ± 0.11	9.51 ± 0.20	9.60 ± 0.25	8.81 ±0.17	8.87 ± 0.18	6.5-8.5
5	Conductivity (µS/cm)	608±31.1	807±35.2	546.6± 5.1	630.6± 38	631.6±38.0	546.6± 5.1	501.6±14.7	686.6±105.0	757.6 ± 33.4	265.0 ± 24.2	375.0± 29.4	697.3± 64.3	600 (WHO) (µS/cm)
6	TDS (mg/l)	3225.0± 37.81	3824.3± 1096	4713.0± 1096	7250.0± 5.1	3511.6± 11.6	2966.6± 47.6	3006.6± 8.16	4001.6± 40.70	4375.0 ± 33.0	1316.0± 5.1	2030.0± 20.0	3520.0±11.6	500 mg/l
7	Total hardness (mg/l)	50.0 ± 1.5	41.6 ± 1.2	32.6 ± 1.0	47.0 ± 1.3	40.0 ± 1.0	24.0 ± 0.9	90.0 ± 4.0	90.0 ± 4.0	140.0 ± 1.2	150. ± 1.8	145.3 ± 1.6	151 ± 1.6	200 mg/l
8	DO (mg/l)	1.4±0.26	7.1±0.82	8.7± 0.85	8.2± 0.09	0.73± 0.4	1.8± 0.08	4.1 ± 9.7	3.5 ± 0.15	3.9 ± 0.18	3.9 ± 0.18	2.41 ± 0.09	4.03±0.24	6 mg/l
9	Free Co_2 (mg/l)	4.4 ± 9.7	4.4 ± 9.7	4.4 ± 9.7	3.6 ± 1.1	2.2 ± 4.8	4.4 ± 9.7	6.6 ± 9.7	4.4 ± 9.7	2.2 ± 4.8	4.4 ± 9.7	5.5 ± 1.2	4.4 ± 9.7	6.3 mg/l

Table 2:*Physico - Chemical parameters of water sample collected from Lakshmipuram tank during 2011-2012. Values are Mean ± S.D (N=6).*

S. No.	Parameters	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	IS:10500 Desirable Limit
1	Color	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Green	Green	Green	Green	-
2	Odour	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Fish odour	Fish odour	Fish odour	Fish odour	Fish odour	Odour less
3	Temperature (° C)	26.0±0.00	27.5±0.0	28.0±0.00	30.0±0.00	29.5 ±0.00	29.0 ±0.00	30.0 ±0.00	29.0 ±0.00	27.5 ±0.00	26.5 ±0.00	27.0 ±0.00	26.0± 0.00	No values
4	pH	8.2 ±0.02	7.6±0.34	8.51±0.22	9.32 ±0.33	9.51 ±0.20	9.50 ±0.19	7.30 ±0.05	7.52± 0.06	7.6± 0.34	8.51 ±0.22	7.20 ±0.09	7.30±0.05	6.5-8.5
5	Conductivity (µS/cm)	118±0.06	112±0.08	193 ±0.01	255± 003	193±0.21	193 ±0.21	197 ±0.30	196± 0.28	196±0.31	210 ±0.41	210±0.41	196 ±0.31	600 (WHO) (µS/cm)
6	TDS (mg/l)	975.1±122	29.66± 476	56.01±207	561.5±20.8	561.5±20.8	561.5±20.8	1214.3±15.52	2429.9± 174.15	2429.9 ± 174.15	2430.7±164.12	2498.5±165.19	2478.7±163.12	500 mg/l
7	Total hardness (mg/l)	90.0±4.99	90.0±4.99	86.66 ±3.7	83.66±2.3	104.6 ±2.46	84.3±2.18	127.44±2.5	116±2.10	212.4 ±4.94	86.66 ±2.33	86.66 ± 2.33	86.66±2.33	200 mg/l
8	DO (mg/l)	2.1±0.84	2.1±0.85	9.4± 0.30	1.4 ±2.43	8.7 ±0.85	0.73 ±0.4	3.9 ±0.18	8.7 ±0.85	1.56 ±0.21	3.38 ±0.13	8.7 ±0.85	2.14 ±0.85	6 mg/l
9	Free Co_2 (mg/l)	6.6 ±9.7E-16	4.4 ±9.7	3.6 ±1.1	6.6± 9.7	2.2± 4.8	5.5±1.2	8.8±1.95 E-15	8.8 ±1.95E-15	3.3 ±1.20	3.6±1.1	4.4±9.7	4.4±9.7	6.3 mg/l

Table 3:*Physico – Chemical parameters of water sample collected from Lakshmipuram tank during 2013-2014. Values are Mean ± S.D (N=6).*

S. No.	Parameters	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	IS: 10500 Desirable Limit
1	Color	Brown	Green	Green	Green	Green	Brown	Brown	Brown	Brown	Brown	Brown	Brown	-
2	Odour	Fish odour	Fish odour	Fish odour	Fish odour	Fish odour	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Odour less
3	Temperature (^{0}C)	25.0±0.00	24.0±0.00	24.0±0.00	25.0±0.00	26.0±0.00	28.0 ±0.00	29.5 ±0.00	27.0 ± 0.00	27.5± 1.00	24.0 ± 0.0	24.5 ± 0.0	26.5 ± 0.0	No values
4	pH	7.6 ± 0.34	7.52±0.06	8.51±0.22	8.60±0.02	7.30±0.05	7.20 ± 0.09	9.51 ± 0.20	8.30 ± 0.08	8.6 ± 0.1	8.4 ± 0.09	8.6 ± 0.1	7.7 ± 0.3	6.5-8.5
5	Conductivity (µS/cm)	119.1±0.07	192.2±0.04	150.9±0.03	239.1±0.21	196.1±0.29	196.5± 0.31	214 ±0.03	187 ± 0.29	502.6± 1.3	543.5± 3.3	638.0 ± 8.1	695.6± 4.9	600 (WHO) (µS/cm)
6	TDS (mg/l)	711.6± 9.3	561.1±20.7	413.3±16.8	1113.3±155.5	1533.83 ± 329.97	975± 1224	2428.3± 163.1	894.2±1223	279.3± 3.2	328.5± 4.8	374.3 ± 5.4	385.5± 23.3	500 mg/l
7	Total hardness (mg/l)	127.33± 2.4	115± 2.09	211.3± 4.86	86.66 ± 3.7	104.6± 2.46	83.66± 2.33	84.77± 2.19	82.66 ±2.29	91.5 ±2.35	82.2±2.21	84.1±2.45	83.6± 2.33	200 mg/l
8	DO (mg/l)	3.38 ± 0.1329	1.4 ± 2.43	1528 ± 1.527	1.56 ± 0.216	9.4 ± 0.30	2.13 ± 0.84	12 ± 0.63	2.00 ± 0.74	8.4 ± 0.1	5.2 ± 0.3	4.9 ± 0.5	5.8 ± 0.4	6 mg/l
9	Free Co_2 (mg/l)	44 ± 9.37	3.3 ± 1.20	4.4 ± 9.7	6.6 ± 9.7E-16	8.8± 1.95E15	8.8 ± 1.9E15	8.8 ± 1.95E15	8.6± 1.7E12	0.44±0.004	0.33±0.003	0.44± 0.004	0.44± 0.004	6.3 mg/l

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