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RESEARCH ARTICLE

TOTAL, DISSOLVED AND SUSPENDED SOLIDS OF IBRAHIMPATNAM LAKE, R.R. DISTRICT, TELANGANA, INDIA

*Rama Devi, A. and Mary Esther Cynthia Johnson

Department of Botany, Osmania University College for Women, Koti, Hyderabad-500195, Telangana, India

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INTRODUCTION

Natural waters, particularly in small lakes, is often rich in dissolved and suspended material. Mostly these dissolved and suspended solids are reported as "total solids". In the present study it was felt appropriate to assess them separately in view of their distinctly different ecological roles. Suspended particles cause turbidity, are the foci of adsorption, and are the carriers of adsorbed materials. A good amount of dissolved solids form the nutrient pool in a water body. Ibrahimpatnam Lake, built in 1850 by the Qutub Shahis covered an area of about 1300 acres originally. To carry more water into this lake, the rulers constructed a 72 km long canal by connecting several smaller water bodies along its way.

Patil *et al.*, 2015 worked on fresh water reservoir of Ajara Tahsil, Kolhapur District (MS), India. Ecological studies on water bodies were carried out by many researchers. Johnson and Ruth 2014 worked on climate change on Saroornagar Lake, Andhra Pradesh, India. Johnson and Ruth 2013 studied Is Lake Banjara on the verge of death? Ruth and Johnson 2012 investigated Water quality of Nadimi Lake, Hyderabad, A.P, India. Shekar *et al.*, 2008 worked on phytoplankton index of water quality. Verma *et al.*, 2011 worked on physico-chemical

and phytoplankton analysis of Kankaria Lake. Johnson 1998 worked on Total Solids content in two fresh water lakes. Zafar *et al.*, 1976 worked on reclamation of Hussain Sager Lake.



Fig.1. Ibrahimpatnam Lake

MATERIALS AND METHODS

Water samples were collected from the Lake Ibrahimpatnam Fig.1. for period of one year i.e., April, 2014 to August 2015, at monthly interval at Site 1 and Site 2. Site.1 is located towards the bund and Site2 towards residential colonies.

The specific procedures selected for analysis are given below:

Total Solids

APHA (1995) Residue was dried at 105^oC for one hour. A well mixed sample is evaporated in a weighed silica basin and

*Corresponding author: Rama Devi, A.

Department of Botany, Osmania University College for Women, Koti, Hyderabad-500195, Telangana, India

dried to constant weight in an oven at 105⁰ for one hour. The increase in weight over that of the empty dish represents the total solids.

Total Dissolved Solids

APHA (1995) A-well mixed sample is filtered through Whatman filtered paper No.42 and the filtrate is evaporated to dry-ness in a weighed silica basin and dried to constant weight in an oven that of the empty dish represents the dissolved solids.

Total suspended solids

Calculations

Total solids (mg/l)- Diss. Solids (mg/l) = Suspended Solids (mg/l)

The difference between the total solids and the dissolved solids gives an estimate of the suspended solids.

RESULTS AND DISCUSSION

Total Solids

Total Solids ranged from 6200-7700 (mg/l) and averaged to 7116 mg/l at site 1. At site 2 they ranged from 6200-7200mg/l and averaged to 6691mg/l. (Tables 1 and 2). In winter season highest concentration of 7550 mg/l and 7551 mg/l at site-1 and site-2 of Ibrahimpatnam Lake. Lowest concentration was seen during summer season at both site-1 and site-2 (Table 3 and 4).

Table 1. Total solids, total dissolved solids and total suspended solids in Ibrahimpatnam Lake site-1

Parameter	2014 April	2014 May	2014 June	2014 July	2014 Aug	2014 Sep	2014 Oct	2014 Nov	2014 Dec	2015 Jan	2015 Feb	2015 Mar	Average
Total Solids mg/l	6600	6200	6700	7000	7200	7300	7100	7300	7400	7700	7600	7500	7116
T.D.S mg/l	6000	5500	6000	6400	6900	6800	7000	7200	7000	7000	6900	6800	6625
T.S.S mg/l	600	700	700	600	300	200	100	100	400	700	700	700	433
T.D.S %	90.9	88.7	89.5	91.4	95.8	97.1	98.5	98.6	94.5	90.9	90.7	90.6	-
T.S.S %	9.1	11.3	10.9	8.6	4.2	2.9	1.5	1.4	4.5	9.1	9.3	9.4	-

Table 2. Total solids, total dissolved solids and total suspended solids at Ibrahimpatnam Lake site-2

Parameter	2014 April	2014 May	2014 June	2014 July	2014 Aug	2014 Sep	2014 Oct	2014 Nov	2014 Dec	2015 Jan	2015 Feb	2015 Mar	Average
Total Solids mg/l	6500	6200	6300	6500	6600	6800	6900	7000	7200	6800	6800	6700	6691
T.D.S mg/l	6000	5800	6000	6100	6000	6500	6600	6800	6900	6700	6700	6600	6391
T.S.S mg/l	500	400	300	400	600	300	300	200	300	100	100	100	300
T.D.S %	92.3	93.5	95.2	93.8	90.9	95.5	95.6	97.1	95.8	98.5	98.5	98.5	-
T.S.S %	7.7	6.5	4.8	6.2	9.09	4.5	4.4	2.9	4.2	1.5	1.5	1.5	-

Total Dissolved Solids

Total dissolved solids are ranged from 5500-7200mg/l and averaged to 6625mg/l at site-1. At site-2 they ranged from 5800-6900mg/l and averaged to 6391 mg/l (Table 1 and 2).

Table 3. Seasonal variation of total solids, total dissolved solids and total suspended solids in Ibrahimpatnam Lake site-1

S.No	Parameter	Summer	Rainy	Winter
1	TOTAL SOLIDS mg/l	6775	7100	7550
2	T.D.S mg/l	6075	6775	7050
3	T.S.S mg/l	700	425	500

Table 4. Seasonal variation of total solids, total dissolved solids and total suspended solids in Ibrahimpatnam Lake site-2

S.No	Parameter	Summer	Rainy	Winter
1	Total Solids	6776	7126	7551
2	T.D.S	6076	6726	7051
3	T.S.S	700	400	501

Table 5. Bruvold and Panborn 1966 have rated the palatability of drinking water according to the TDS level as follows:

Grades	TDS levels
Excellent	< 300 mg/L
Good	300-600 mg/L
Fair	600-900 mg/L
Poor	900-1200 mg/L
Unacceptable	>1200 mg/L

Table 6. Drinking Water Standard Limits By WHO and BIS

Parameter (mg/L)	Standard Limits Maximum Permissible Limit	
	WHO (1984)	BIS (1983)
Total Dissolved Solids	1000	1500
Total Suspended Solids	-	100

During winter season highest concentration of TDS was seen i.e 7050mg/l at site -1 and 7050mg/l at site-2(Table 3and4). The %of TDS ranged from 88.7 to 98.6 at site-1. At site-2 TDS % ranged from 90.9 to 98.5 (Table1and 2). According to BIS (1983) and WHO (1984) the permissible limit drinking water 1500 mg/l and 1000 mg/l. Hence this Lake water cannot be used for drinking. This is shown in Table 6. Bruvold and Pan born, 1966 have rated the pat ability of drinking water based on TDS. This is shown in Table 5.

TDS formed the dominant component and was more than 90% at Site 1 and Site 2.

Total Suspended Solids

Total Suspended Solids ranged from 100-700 mg/l and averaged to 433 mg/l at site-1. At site-2 they ranged from 100-600 mg/l and averaged to 300 mg/l.

Conclusion

The permissible limit given by WHO 1984 and BIS 1983 1000mg/L and 1500mg/L for drinking water for TDS and 100

mg/L for TSS. Hence the lake water cannot be used for drinking. Based on Bruvold and Panborn 1966 Ibrahimpatnam lake are unacceptable for drinking purpose > 1200 mg/L. According to BIS 1983 and WHO 1984 the water quality is beyond the permissible limit and cannot be used for drinking purpose.

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