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GRT IMPACT OF HUMAN INTERFERENCE DURING YATRA DAYS ON PHYSICOCHEMICAL PARAMETERS FROM CHANDRABHAGA RIVER, PANDHARPUR (M.S.)

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Abstract:-India has a rich heritage of pilgrim centres. The Pandarpur is one of the famous pilgrim centres of Maharashtra. It is also called as Dakshin kashi where Bhima River is flowing by taking a shape of crescent moon therefore, it is famously called as Chandrabhaga river. Lacks of devotees visit to Pandharpur every year during Ashadi, Kartik, Magh and Chaitree yatras. These devotees use the water of Chandrabhaga for taking holy bath and other human activities. The human interference is increased enormously during these days. It may lead to deterioration of water quality. To study the effect of water quality the samples were collected in between and after the yatra days. The physico chemical parameters such as temperature, pH, dissolved oxygen, total hardness, total alkalinity, calcium, turbidity etc. were analysed for the study. Dissolved oxygen, total hardness and turbidity greatly showed variations during yatra days and after the yatra day's sample. The quality of water gives indication of intensity of pollution in the water.

Keywords: physicochemical , human interference , chemical parameters , physico-chemical .

INTRODUCTION:

Earth is encircled by 75 % of water. With the help of this resource all living organisms are living their life. Lakes, tanks, rivers, ponds, streams etc. are fresh water resources in the entire earth. Bhima river originates from Bhimashankar in Maharashtra. This River is a tributary of the Krishna river. Bhima river provides water for all organisms in the area of the river. And when it enters into Pandharpur city of Maharashtra then it is one of the important pilgrim centres in Maharashtra and it is attracted by lacks of devotees during various yatra days. Every year the number of devotees increases tremendously which directly affects over all the load of pollution in Bhima river (Pantage et al., 2006).

The lacks of devotees visits during four major festivals which are Ashadi wari, Kartik wari, Magh wari and Chaitree wari. The devotees who involved in these yatra are popularly known as 'Warkaris'. The Ashadi yatra comes during monsoon season. In all approximately seven to eight lacks of devotees visit Pandharpur on Ashadi Ekadashi. Kartik wari comes immediately after the monsoon season and approximately three to four lacks of devotees visit Pandharpur. The Magh wari celebrated in the late winter season and about two lacks of devotees visit this holy place. During Chaitree wari which comes in summer season, nearly one lack of devotees gather together. Due to overcrowding of the devotees the Bhima river is getting highly polluted. This results in the variations of physicochemical parameters. Deterioration of water quality and eutrophication is the result of discharge of domestic sewage and industrial effluents in the natural water resources (Shaw et al., 1991). It is necessary to provide safe drinking water and sanitation to the relative areas by using cost effective tools to eliminate all water born disease as a problem. (Raja et al., 2008). Because of human interference quality of water getting affected and it might invite water born disease. The present investigation is aimed to understand variations in different physicochemical parameters due to human activities at the time of four yatra days.

MATERIALS AND METHODS

The water samples were collected from the selected site which is nearer to the main temple. This site is mostly visited

by large numbers of pilgrims. The water samples were analysed to assess for physico-chemical parameters such as air temperature, water temperature, pH, dissolved oxygen, total hardness, total alkalinity, calcium, chloride, fluoride, ammonia and turbidity. The experiments were conducted during 30th June 2012 to 30th July 2012. In between these periods the water samples were collected at the time of yatra and after the yatra. During the collection period at the time of summer season, the Chaitree yatra observed but due to lack of water at the site, the release of water in to the revering side was negligible therefore water sample collected during Ashadi yatra and after Ashadi yatra and during Kartik yatra and after Karik yatra similarly during Magh yatra and after Magh yatra. And finally during Ashdi yatra and after Ashadi yatra.

Likewise the water samples were collected before and after all three different yatra days. Air temperature and water temperature was recorded by using thermometer at the time of collection of each sample. pH of water sample analysis was performed with the help of pH meter. The turbidity of water sample was found out with the help of turbidometer. The dissolved oxygen, total hardness, total alkalinity, calcium, chloride, fluoride and ammonia were analysed by using standard method of APHA (2005).

RESULTS AND DISCUSSION



Study Site of Pandharpur

Table: 1 PHYSICO CHEMICAL PARAMETERS DURING ASHAD YATRA IN 2012

Sr. No	Parameters	AT ASHAD YATRA (30 June 2012)	AFTER ASHAD YATRA (10 July 2012)
1	Air Temperature(°C)	29.0±0.50	28.5±0.36
2	Water Temperature(°C)	27.5±0.50	28.8±0.20
3	pH	7.0±0.12	7.0±0.16
4	Dissolved Oxygen (ppm)	2.0±0.15	3.5±0.25
5	Total Hardness(ppm)	260±4.08	235±2.50
6	Total Alkalinity(ppm)	223±2.50	200±2.50
7	Calcium(ppm)	100±0.25	75±0.50
8	Chlorides(ppm)	70±2.9	72±2.5
9	Fluorides (ppm)	0.68±0.02	0.9±0.09
10	Ammonia(ppm)	0.43±0.12	0.52±0.004
11	Turbidity(NTU)	11±0.62	10.9±0.59

Table: 2 PHYSICO CHEMICAL PARAMETERS DURING KARTIK YATRA IN 2012

Sr. No	Parameters	AT KARTIK YATRA (24 Nov. 2012)	AFTER KARTIK YATRA (10 Dec. 2012)
1	Air Temperature(°C)	20.9±0.12	18.0±0.62
2	Water Temperature(°C)	20.5±0.20	18.5±0.20
3	pH	7.82±0.04	6.85±0.05
4	Dissolved Oxygen (ppm)	3.30±0.062	4.70±0.028
5	Total Hardness(ppm)	335±2.51	195±4.08
6	Total Alkalinity(ppm)	250±30	180±3.60
7	Calcium(ppm)	170±1.60	98±0.80
8	Chlorides(ppm)	78±2.05	69±2.86
9	Fluorides (ppm)	0.63±0.020	0.50±0.040
10	Ammonia(ppm)	0.60±0.04	0.75±0.062
11	Turbidity(NTU)	20±0.81	14±0.40

Table: 3 PHYSICO CHEMICAL PARAMETERS DURING MAGH YATRA IN 2013

Sr. No	Parameters	AT MAGH YATRA (21 Feb. 2013)	AFTER MAGH YATRA (8 March 2013)
1	Air Temperature(^o C)	28.8±0.32	30.2±0.16
2	Water Temperature(^o C)	27.2±0.20	28.5±0.32
3	pH	7.8±0.15	6.2±0.15
4	Dissolved Oxygen (ppm)	1.4±0.10	1.9±0.05
5	Total Hardness(ppm)	190±5.00	170±2.50
6	Total Alkalinity(ppm)	170±2.50	158±3.00
7	Calcium(ppm)	162.8±0.40	175±1.60
8	Chlorides(ppm)	99±0.40	73±1.24
9	Fluorides (ppm)	1.5±0.08	1.2±0.16
10	Ammonia(ppm)	1.5±0.20	0.8±0.20
11	Turbidity(NTU)	18±0.81	19±0.81

Table: 4 PHYSICO CHEMICAL PARAMETERS DURING ASHAD YATRA IN 2013

Sr. No	Parameters	AT ASHAD YATRA (19 July 2013)	AFTER ASHAD YATRA (30 July 2013)
1	Air Temperature(^o C)	23.4±0.40	23±1.00
2	Water Temperature(^o C)	20.0±0.80	20.5±0.10
3	pH	7.9±0.2	7±0.1
4	Dissolved Oxygen (ppm)	3.8±0.3	5±0.15
5	Total Hardness(ppm)	198±2.50	173±2.00
6	Total Alkalinity(ppm)	195±3.20	120±2.50
7	Calcium(ppm)	135±1.70	120±2.50
8	Chlorides(ppm)	90.2±0.15	80±2.5
9	Fluorides (ppm)	0.69±0.05	0.30±0.01
10	Ammonia(ppm)	0.80±0.20	0.45±0.05
11	Turbidity(NTU)	16±1	19±1.50

Due to the interference of human activities the Bhima river is getting polluted and the sample were collected during yatra days and after yatra days for assessment. The air temperature and water temperature does not show much variation. Accordingly a yatra event comes in summer and winter season. The air temperature was ranges between 180c to 300c which is minimum 180c on 21 December 2012 and it is noticeable after Kartik yatra and maximum is 300c on 8 March 2013 after Magh yatra. The water temperature was minimum 18.50c 21 December 2012 after Kartik yatra and maximum is 28.80c on 10 July 2012 after Ashadi yatra.

The recorded pH was minimum 6.2 on 8 March 2013 after Magh yatra while maximum was 7.9 on 19 July 2012 at Ashadi yatra. Sharma et al., (2011) observed that the pH of Narmada river water sample in pre monsoon season was found to be in range of 7.7 to 8.9 and in monsoon season 7.6 to 9.9.

Dissolved oxygen is highly fluctuating parameter of water. The value of dissolved oxygen was in range between 1.4ppm to 5ppm. The minimum value was 1.4ppm at Magh yatra in 21 February 2013 and the maximum value of dissolved oxygen was 5 ppm recorded after Ashadi yatra in 19 July 2013. Shivasharanappa and Yalakpalli (2012) observed dissolved oxygen content varied in a limited range of 5.91 mg/l to 8.97 mg/l at upstream sampling point and 5.23 mg/l to 5.92 mg/l at downstream sampling point.

Total hardness of water varies due to the human intervention in the river. The value of total hardness is range between 170ppm to 335ppm. The minimum value was 170 after Magh yatra on 8 March 2013 and maximum value was 335ppm at Kartik yatra on 24 November 2012. Tubonimi et al., (2010) analysed that the level of total hardness along with the Amadi creek was so high that total hardness become exceedingly high and water become very hard.

Human activities directly influence the alkalinity of the fresh water bodies including tanks. The total alkalinity ranges between 158ppm to 250ppm. The minimum value of total alkalinity was 158ppm after Magh yatra on 8 March 2013 and the maximum value was 250ppm at Kartik yatra on 24 November 2012. The similar kinds of observations are made by Jawale et al., (2005).

The calcium is a dominant cation which is exists in the water. The value calcium was in range between 75ppm to 175ppm. The minimum value was 75ppm of calcium recorded in Ashadi yatra on 30 June 2012 and maximum value was 175ppm after Magh yatra on 8 March 2013. Dhrendra et al., (2009) analysed similar result about calcium.

Chloride ion in excess from the fresh water tanks, rivers and streams is an good indicator of fecal contamination(<http://en.wikipedia.org/wiki/Chloride>). The value of chloride was ranged in between 69ppm to 99ppm. The minimum value of chloride was observed 69ppm after Kartik yatra on 21 December 2012 and maximum was 99ppm at Magh yatra on 21 February 2013. Thakare et al., (2012) observed the chloride concentration in the range of 38.7ppm to 170.4ppm.

Higher concentration of fluoride causes dental fluorosis. At the same time the concentration of fluoride less than 0.5 mg/l dental moulting and dental cares analysed by Vidhvati et al., (2009). The fluoride value was ranged in between 0.30ppm to

1.5ppm. The minimum value of fluoride was 0.30ppm recorded after Ashadi yatra on 30 July 2013 and maximum was 1.5ppm at Magh yatra on 21 February 2013.

The analysed value of ammonia was range between 0.43ppm to 1.5ppm. The minimum value of ammonia was 0.43ppm recorded during Ashadi yatra on June 2012 and maximum was 1.5ppm during Magh yatra on 21 February 2013. Joseph et al., (2013) ammonia of water was observed exceed value during four sampling per month of their studies.

Turbidity of water may be due to various activities of water. Turbidity of water was in the range between 0.9 NTU to 18 NTU. The minimum value 0.9 NTU was observed after Ashadi yatra on July 2013 and maximum value was 18 NTU during Magh yatra on 21 February 2013. Avvannar (2007) stated that turbidity is a measure of cloudiness in water.

CONCLUSION

From our result it can be concluded that irrespective of season and different yatras it was observed at Pandharpur various anthropogenic activities of the pilgrims visiting this holy temple has direct influence on physicochemical parameters of the water. As the regular practice, the water which is being used during the yatra days for the sake of holy dip the some water is being stored at Takali, Solapur district temporally and supply to the public for the consumption and other activities, after treatment at Soregaon water treatment plant. From our result it is suggested that water purification plant must be modernised to eliminate unwanted material from Chandrabhaga river water. It is also suggested from our work that the pilgrim's intervention have to be minimized as far as the river water is concerned. There should be a special site to be created for pilgrims to observe the holy dip in Chandrabhaga River. After that water should be properly treated and released in to river side. It is also the need of hour, that proper drainage and hygienic system should be implemented with the cooperation of Government and Non-Government organisations. Public participation also equally important for keeping Chandrabahga River holy and pollution free.

REFERENCES

1. APHA, (2005) standard method for the examination of water and waste water analysis 21th Edn. Washington D.C.
2. Environmental Status Report of Pandharpur (During Ashadhi ekadashi) (2005), Maharashtra pollution control board, regional office, Pune.
3. Avvannavar Santosh M., (2007), Studies on pollution on river Nethravathi, Karnataka, Nature Environment and pollution technology, vol.6, No. (3), pp 541-542.
4. Raja P., A. Muhindhar Amarnath, R. Elangovan and M. Palanivel, (2008), Evaluation of physic chemical parameters of river Kaveri, Teruchirappali, Tamil Nadu, India, Journal of Environment Biology, 29 (5), pp765-768.
5. Joshi Mohan Dharendra, Alok Kumar and Namita Agarwal, (2009), Studies on physic chemical parameters to assess the water quality of river Ganga for drinking purpose in Haridwar District, RASAYAN J. Chem. Vol.2, No.1, pp195-203.
6. Vidayavati H., B.E. Basavarajappa and E.T. Puttaiah, (2009), An assessment of ground water pollution and its chemical quality in Harapanahalli taluk, District, Davanagere, Karnataka, J. Aqua.Bio., vol.24 (1), pp81-86.
7. Jawale. C.A., R.V. Rohikar, D.V. Mendkudale and M.G. Babare, (2009), Seasonal variation in different physic chemical parameters of second terna makani reservoir in relation to pisciculture, Osmanabad District, Maharashtra, J. Aqua.Bio., vol.24(1), pp87-90.
8. Tubonimi J.K. Ideriah, Omudo Amachree and Herbert O. Stenley, (2010), Assessment of water quality along Ameedi Creek in Port Harcourt, Nigeria, Scientia Africana vol.9, No(1), pp150-162.
9. Thakare B. Pawan, M.D. Chaudhary and P.V. Tekade, (2012), Chemical studies of metal pollutants on spectrophotometer of water in the river of Wardha District, Scholars Reseach Library, Der. Pharma. Chemica, 4(2), pp755-760.
10. Shivsharanappa and Anad Yalakpalli, (2012), Study on the physic chemical and biological characteristics of Bhima River in Gulbarga District, Karnataka state, India, ijCEPr, vol.3, No.(1), pp96-108.
11. Patange Priyanka, Srinithihahshini N.D., Makajan D.M., (2013), Pilgrim and the environment challenges in a pilgrimage centre in Maharashtra, India, International Journal of Environmenal Sciences, vol.3, No.(6), pp2269-2277.
12. Rakesh V.B. and Joseph Ammini, (2013), Evaluation of pollution status of Chakkamkandam Lake, India using water quality index, J. Environ. Res. Develop., vol.7, No. (3), pp1311-1315.
13. <http://en.wikipedia.org/wiki/Chloride>



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