

ORIGINAL RESEARCH ARTICLE

STUDY ON HYDROBIOLOGICAL PARAMETERS OF GODAVARI RIVER AT PAITHAN

D. R. Deshmukh

Department of Zoology, Pratishthan Mahavidyalaya, Paithan,

Dist - Aurangabad, M.S. 431 007

Corresponding author E-mail: deshmukhdnyan@gmail.com**Article Citation:**

D. R. Deshmukh (2017): Study on hydrobiological parameters of Godavari river at Paithan, J. Sci. Res. Int, Vol. 3 (2): 30 – 34.

© **Copyright:** 2017 | This is an open access article under the terms of the Bhumi Publishing, India

ABSTARCT:

The present study deals with the seasonal variation in hydrobiological parameters of godavari river water. the hydrobiological parameters such as Temperature, Dissolved oxygen PH, Alkalinity, Hardness, TDS and BOD of water playing an important role in the distribution of planktonic flora and fauna. The present work on hydrobiological parameters provides information on quality of water of Godavari River near Paithan. . Additions of sewage, domestic and agricultural waste, use of organic and inorganic fertilizers may responsible for eutrophication.

KEYWORDS: Hydrobiological parameters; Godavari river; Paithan.

INTRODUCTION:

Godavari river originates at Trimbakeshwar near Nashik in Maharashtra (India) and after travelling about 1500 km merges in the bay of bengal . It has total catchment area of 312,812sq km of which 63.3% lies in maharashtra (Rajput, 1990). Its main tributaries are Pravara, Purna, Penganga, Wainganga and Shivani in Maharashtra. Godavari discharges 93 km³ of water annually into Bay of Bengal, which is 1/4th of ganga's discharge. Godavari, the second largest basin of the country covers an area of the Deccan peninsula equivalent to 10 % of the country; hence Godavari river is considered to be the 'Ganges of Deccan'. Many researchers have investigated the limno-chemistry and characteristics of Indian river (Manikya Reddy, 1984; Mahajan, 1988;

Adawant,1989; Deshmukh and Ambhore, 2006; Deshmukh and Sonawane, 2008; ,Bhadane 2016; Deshmukh and Sathe, 2014). The present work on hydrobiological parameters provides information on quality of water of Godavari river near Paithan. . As the river flows through rural and urban area, it receives various domestic, agricultural and industrial effluents; hence, water is assessed for its water quality and the impact of various human and cultural activities on physico-chemical and biological characteristics.

MATERIALS AND METHODS:

Water samples were collected from sampling station and they were brought to the laboratory. The temperature of water was measured

by thermometer at the spot, the dissolved oxygen was calculated in the laboratory by using the Wrinkler's method.



Figure showing Maps of Godavari River

pH of river water was calculated by using digital pen pH meter, the alkalinity was calculated by using the phenolphthalein and methyl orange indicator and the samples were titrated against the NH_2SO_4 solution. Hardness of water was calculated by using erichrome black't' indicator. TDS and BOD are calculated by APHA (1985).

RESULTS AND DISCUSSION:

Temperature:

Temperature ranges between 16 to 27.5°C. The minimum temperature 16°C was recorded in January (winter season) where as hottest during the May (summer) i.e. 27.5c (Table 1) seasonal variations were observed in water temperature which also exhibited a correlation with atmospheric temperature by Zingade (1981), Welch (1952) has observed that shallow water reacts more quickly to change in atmospheric temperature. Muley and Patil (2006) recorded that maximum temperature was recorded during pre monsoon and lowest during winter.

Fluctuations have been observed in the monthly values of dissolved oxygen (DO) which ranges between 1.7 to 3.4mg/lit. (Table 1).

Dissolved Oxygen:

The dissolved oxygen in the month of march is minimum (1.7) where as maximum in the month of October (Masood Ahmed and Krishnamurthy, 1990) showed a positive correlation between temperature and duration of sunlight. Soluble gases like dissolved oxygen in water at given temperature depends like factors like temperature of water, partial pressure of the gas in contact with water, the concentration of dissolved salts, biology activity. Mathew et al., (1992) have shown that high dissolved oxygen levels are associated with higher pH of water. Deshmukh (1964), Goldman and Horne (1983) and Prakash (1982) reported that the concentration of DO is inversely proportional to the concentration of CO_2 . Dhare and Gaikwad (2006) observed that dissolved oxygen is minimum in May and maximum in February month.

pH:

The PH parameter is one of the most important hydrobiological parameters that serves as an index for pollution. The pH is the value expressed as the negative logarithm of the hydrogen ion concentration. Moore (1950), Ganpati (1960), Singh (1995), Verma (1978) and Vyas et al (1968) showed that the pH of the Indian river ranges between 7.3 to 9. Saxena (1978) reported that many factors affect the pH value. These factors are photosynthesis, exposure to air, disposal of industrial waste and domestic sewage. In the present investigation the pH value of the water ranges 7.3 -8.8 during the year 2002 (Table -1). Chandrashekar (1997) noted alkaline PH over 2 year study period in urban centers, pH of water is also highly influenced by nature of pollution in the form of sewage and industrial effluents Kodarkar (1995). Muley and Patil (2006) recorded that there is a slight alkaline nature of Pauna river.

Alkalinity:

The alkalinity of river water ranges from 174 to 192 mg/lit. Carbonates and bicarbonates are responsible for the alkalinity of water. The alkalinity of river water is low during August month and is high during february month. From the above observations we conclude that the alkalinity is high during winter

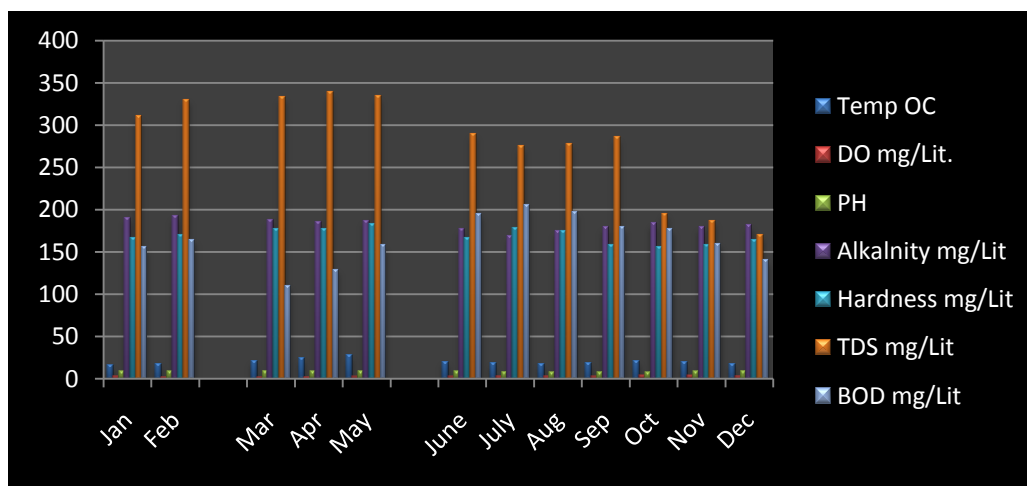
and summer whereas low during monsoon season. Bishop (1973), Adebisi (1981) showed that alkalinity was inversely related to the water level. Nalina and Puttaiah (2006) recorded that alkalinity is maximum

in summer season and minimum in rainy season due to dilution of ground water with percolated rainwater.

Table 1. Seasonal variation in Hydrobiological parameters of Godavari river near paithan (2010)

Months	Temp °C	DO mg/lit.	pH	Alkalinity mg/lit	Hardness mg/lit	TDS mg/lit	BOD mg/lit
Jan	16	2.8	8.3	190	166	310	155
Feb	18	1.9	8.4	192	170	330	164
Mar	21	1.7	8.7	188	176	333	110
Apr	24.5	2.1	8.5	184	177	339	129
May	27.5	2.2	8.6	187	182	334	158
June	20	2.3	8.0	177	166	289	195
July	19	2.8	7.8	168	178	275	205
Aug	18	2.8	7.5	174	174	278	197
Sep	19	2.7	7.6	179	158	285	179
Oct	21	3.4	7.3	183	155	195	176
Nov	20	3.3	8.1	179	158	187	160
Dec	18	3.0	8.8	181	164	170	140

Figure 1. Seasonal variation in Hydrobiological parameters of Godavari river near Paithan



Hardness:

Hardness of water ranges from 155 to 182 mg/lit.(Table1) hardness of water is mainly due to the presence of carbonate (ca++and mg ++) and expressed as an equivalent amount of caco3. The high

concentration of hardness ranging between 150-300ppm and above may cause heart diseases and kidney problem in fish. The maximum value of water hardness in river kali was reported to be 488g/lit by George et al (1966). While in river Ganga at kanpur

hardness fluctated between 112to250 mg/lit by Saxena et al (1866) hardness is found to be low (155mg/lit) during October where as high (182 mg/l) during may month. Muley and Patil (2006) observed that hardness is higher in February and lower during July.

Total Dissolved Solids (TDS):

The total dissolved ranges from 170 to 339 mg/Lit.TDS is lower in December where as higher in April month. The amount of dissolved solid is increases due to release of decaying matter from aquatic vegetation. The minimum dissolved solids are observed in winter where as maximum are observed in summer was noted by Jayaraman et al . (2003). Increase in TDS, increases hardness of water was recorded by Shastri et al. (2004) and Deshmukh and Sathe (2014).

Biochemical Oxygen Demand (BOD):

It is indicator parameters to know the presence of biodegradable matter in waste and express degree of contamination. Biochemical oxygen demand ranges from 140 to 205 mg/Lit.BOD level is more in monsoon season then winter and summer due to less quantity of solid and microbial population reported by Singhai et.al (1990).

ACKNOWLEDGEMENT:

The authors are thankful to the UGC, WRO Pune for providing financial assistance and also thankful to the Principal Pratishtan Mahavidyalaya, Paithan for Providing the necessary facilities required for this work.

REFERENCES:

1. Adebsi ,B. A. (1961) ,Hydrobial . 79 pp157-165.
2. Adwant, M .P.(1989) ,Ph .D thesis , Dr. Babasaheb Ambedkar marathwada university ,Aurangabad (MS) india.
3. APHA (1985) 16th edition , APHA washington ,dc indian council of medical research (icmr) 1975 drinking water standards icmr ,new Delhi .
4. Bishop J.E. (1973) , sungai gomback dr .w.junk publishier the hague pp.485
5. Chandrashekar S.V.A. (1977) ph .d. Thesis Osmania university Hyderabad (AP) india.
6. Deshmukh, B.S. and Sathe, S.D(2014), Journal of Aquatic Biology and Fisheries. 2 ,pp101 -105
7. D. R. Deshmukh and S.R. Sonawane(2008),J. exp. Zool. Vol. 11(1)pp 143-145.
8. Deshmukh J.U and Ambore N.E (2006) ,J aqua biol 21,pp 93-96.
9. Deshmukh S.B. (1964) ,Indian J. Environ.hlth6, pp166-188.
10. Dhere R.M. and Gaikwad J.M.(2006) ,J.Aqua biol 21,pp86-88
11. Ganapati S.V(1960),.proc. Symp .algology.icar new Delhi,pp204-218.
12. George I.P,venugopal S. and venkateshwer K (1986) ,Indian j. Environ hlth 28,pp303-313.
13. Jayaraman, P.R., Ganga Devi, T. and Vasudevan Nayar, T.(2003),. *Poll. Res.*, 22(1): 89-100.
14. Goldman C.R and Horne A.J (1983) *Limnology.int ste. Ed miii book co london*
15. Kodarkar M.S (1995) *Conversation of lakes indian association of aquatic biologists(iaab) Hyderabad pub ,3 ,1-82*
16. Mahajan K.K (1988),*Ecology and pollution at indian river 1:1PP38.*
17. Manikya Reddy (1984) P.hd. Thesis Osmania university ,Hyderabad.
18. Masood ahmed and krishnamurthy R (1990) *J environ. Biol*, 11,PP,335-343.
19. Mathew verghese ,Anil chauhan and I.P Naik (1992) *Poll Res*
20. Muley D.V and Patil I.M. (2006) *J. Aqua biol*. 21,PP, 68-75.
21. Nalina E and E.T puttaiaha (2006) *J.Aqua.biol*.21PP,105-110.

22. Moore W.G (1950). Lake providence.ecology 31PP, 113-118.
23. Prakash C(1982) water quality of keetham lake(soor sarovar) J. Envnt.
24. Prakash R.A (1999). PhD . Thesis . Dr. Babasaheb ambed kar marathwada university, aurangabad (m s) india.
25. Singhai S., Ramani G.M. and Gupta U.S. (1990) Limnological (Barlin)21(1) PP,293-301.
26. Saxena K.I ,Chakraborty R.N , Khan A.K,Chattopadhy S.N and Chandrah (1966) Environ . Health PP 270-285.
27. Saxena M.M (1987) Environmental analysis of water, air and soil agro. Botanical .publ india.
28. Shastri,Y.C,Sonawane, Y.D.and Pingale,S.D (2004) *J. Ecotoxicol. Environ. Monit.*, 14(2)PP 137-141.
29. Singh M (1965) phytoplankton periodicity in a small lake near Delhi.
30. Verma S.R ,Tyagi A.K and Dalela R.C (1978). Proc .India.Acad. Sci. B.87,PP123-131.
31. Vyas I.N and Kumar H.D (1968) Hydrobiologia 31PP,421-434.
32. Welch P.S (1952) Limnlogy 2nd Edition Mc craw hill book co. N. Y. 536
33. Zingade M.D (1981) indian J. Mar. Sci 10,101.