

Study of physico-chemical parameters of Uma river Basin dist- Washim (M.S.), India

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Abstract

Assessment of some physico-chemical parameters like water temperature, pH, turbidity, total dissolved solids, dissolved oxygen, and chlorides were taken. Finally it may be concluded that the water parameters are within permissible limit and support fish diversity in Uma River Basin Dist. Washim (M.S.). Water temperature ranges from 20.1 °C to 27.8 °C the maximum water temperature was recorded in the winter months and maximum in the summer months. pH was observed that pH of water is minimum during winter and higher in summer season. Turbidity of river water result shows all the five stations had different values in all seasons. During study period the total dissolved salts (TDS) was maximum in rainy season (343.5 mg/l) and was minimum during summer (127.4 mg/l). It was observed that the value of D.O. fluctuates from 5.20 mg/l to 11.40 mg/l. The maximum values 11.40 mg/l was recorded in the month of May (summer) and minimum values 5.20 mg/l in the month of December. The maximum values of chlorides recorded during monsoon season while in summer less chloride content was detected.

Key Words: Uma River, pH, DO, Turbidity, Total dissolved solids.

1. Introduction

Water is unique component of nature and play an important role in the life from unicellular animals to man. The quality of water is described by its physical, chemical, and biological characteristics. Numerous man-made activities like addition of kitchen, bathrooms and toilet waste, industrial waste water, excess use of chemical fertilizers and pesticides has polluted

environment of both surface and ground water. Increases in urbanization, industrialization, agriculture activity are harmful for fresh water resources in the nature. Water of Uma River is basically utilized for domestic, agriculture and fisheries purpose. Many researchers [1-3] have done studies on physico-chemical properties of river water, dam and reservoir. However, no work has been carried out on water quality of Uma River Basin Dist. Washim (M.S.), hence present study was carried out. Also the objectives of the present study were to document the fish diversity in relation to physico-chemical characteristics of water and suggest appropriate conservation and management strategies.

2. Materials and Methods

The water samples were collected from an Uma River Basin from five selected sites (A- Poha village, B- Kajaleshwar dam, C- Umari Arab Bridge, D- Dahatonda Bridge, E- Durgawada village) for a period of one year during the year Feb. 2015 to January 2016. The physical parameters such as river water temperature were recorded by using thermometer. The river water turbidity was measured by using secchi disc. The pH was determined by using Hanna pH meter. The chemical parameters of river water such as dissolved oxygen, and chlorides were determined by standard methods suggested by APHA [4].

3. Results and Discussion

Water samples from each station were collected in every month from various sites of five different stations from Uma River Basin. Result of physico-chemical parameters are given below

Table 1: Water temperature and pH of Uma River Basin

Sr. No.	Months	Water temperature (°C)					pH				
		A	B	C	D	E	A	B	C	D	E
1	February 2015	21.2	21.6	21.3	21.8	21.9	8.5	8.4	8.4	8.4	8.5
2	March 2015	22.0	22.4	22.0	22.7	22.8	8.2	8.2	8.1	8.4	8.3
3	April 2015	26.3	26.3	26.8	26.9	26.8	8.3	8.2	8.1	8.3	8.3
4	May 2015	27.4	27.6	27.5	27.8	27.8	8.2	8.2	8.2	8.7	8.6
5	June 2015	27.5	27.8	27.4	27.6	27.0	8.4	8.4	8.3	8.7	8.9
6	July 2015	26.2	26.4	26.0	26.5	26.5	8.6	8.5	8.1	8.8	8.8
7	August 2015	25.7	27.1	27.0	26.4	27.2	8.1	8.2	8.4	8.4	8.1
8	September 2015	24.0	26.2	26.6	27.2	27.1	8.5	8.4	8.4	8.4	8.3
9	October 2015	23.0	25.0	24.1	24.3	26.4	7.2	7.4	7.2	7.3	7.3
10	November 2015	23.0	24.6	24.4	24.1	25.2	7.5	7.4	7.7	7.5	7.8
11	December 2015	21.0	21.8	22.0	21.7	21.6	7.6	7.6	7.8	7.8	7.9
12	January 2016	20.4	20.1	21.0	21.2	21.4	8.2	8.4	8.3	8.3	8.4

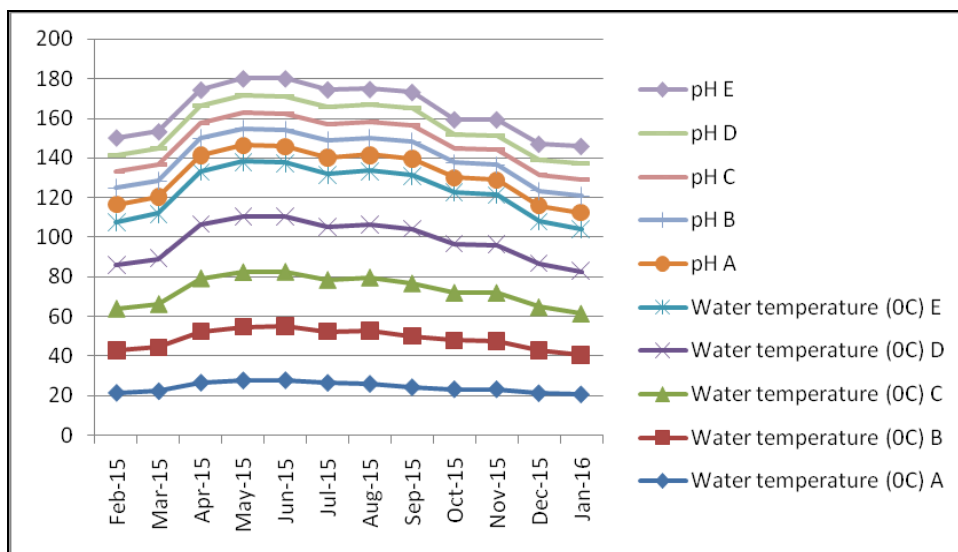


Fig 1: Water temperature and pH of Uma River Basin

Table 2: Turbidity (NTU) and TDS of Uma River Basin

Sr. No.	Months	Turbidity (NTU)					Total dissolved solids(mg/l)				
		A	B	C	D	E	A	B	C	D	E
1	February 2015	9.25	9.90	9.20	9.70	9.70	220	225	260	265	270
2	March 2015	9.60	9.80	9.80	9.60	9.70	260	260	270	270	260
3	April 2015	8.50	8.50	8.70	8.75	8.75	155	160	165	160	160
4	May 2015	6.10	6.25	6.90	6.60	6.60	128	127	127	130	135
5	June 2015	7.14	7.60	7.60	7.10	7.10	226	230	235	220	220
6	July 2015	8.16	8.40	8.40	8.50	8.50	215	215	230	225	225
7	August 2015	8.28	8.26	8.26	8.25	8.60	218	216	230	220	220
8	September 2015	8.60	8.65	8.65	8.60	8.66	210	211	217	217	228
9	October 2015	8.30	8.35	8.35	8.40	8.45	365	338	330	330	345
10	November 2015	7.80	7.85	7.60	7.60	7.60	340	343	341	340	340
11	December 2015	7.15	7.25	7.25	7.40	7.45	315	315	320	322	330
12	January 2016	7.10	7.15	7.20	7.10	7.35	311	218	218	320	240

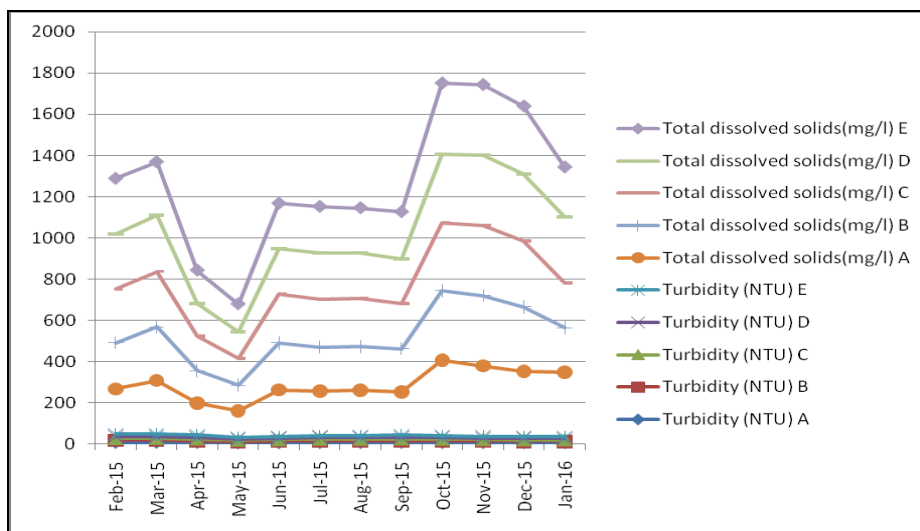


Fig 2: Turbidity (NTU) and TDS of Uma River Basin

Table 3: Dissolved oxygen and Chlorides of Uma River Basin

Sr. No.	Months	Dissolved oxygen (mg/l)					Chlorides (mg/l)				
		A	B	C	D	E	A	B	C	D	E
1	February 2015	7.80	7.95	7.80	7.85	7.90	12.8	12.2	1.6	12.4	12.6
2	March 2015	10.90	10.60	10.60	10.80	10.75	13.7	13.4	12.3	13.5	13.5
3	April 2015	11.10	11.25	11.30	11.30	11.30	13.9	13.8	13.6	13.8	13.7
4	May 2015	11.20	11.35	11.30	11.40	11.20	14.0	14.2	14.1	14.0	14.1
5	June 2015	7.10	7.30	7.70	7.80	7.60	12.6	12.3	12.4	12.3	12.6
6	July 2015	6.25	6.30	6.55	7.10	7.90	12.8	12.9	12.1	12.1	12.0
7	August 2015	6.40	6.45	6.30	6.80	7.70	12.7	12.6	12.7	12.4	12.6
8	September 2015	6.40	7.55	6.50	6.80	7.10	11.6	11.4	11.5	11.7	11.9
9	October 2015	6.25	6.30	6.30	6.60	6.70	10.2	10.7	10.5	10.6	10.4
10	November 2015	5.40	5.45	5.60	5.50	5.90	9.7	9.6	9.6	9.9	9.9
11	December 2015	5.20	5.25	5.55	5.70	5.85	9.5	9.3	9.1	9.3	9.6
12	January 2016	8.20	8.10	7.60	7.15	6.90	9.8	9.7	9.7	9.8	9.8

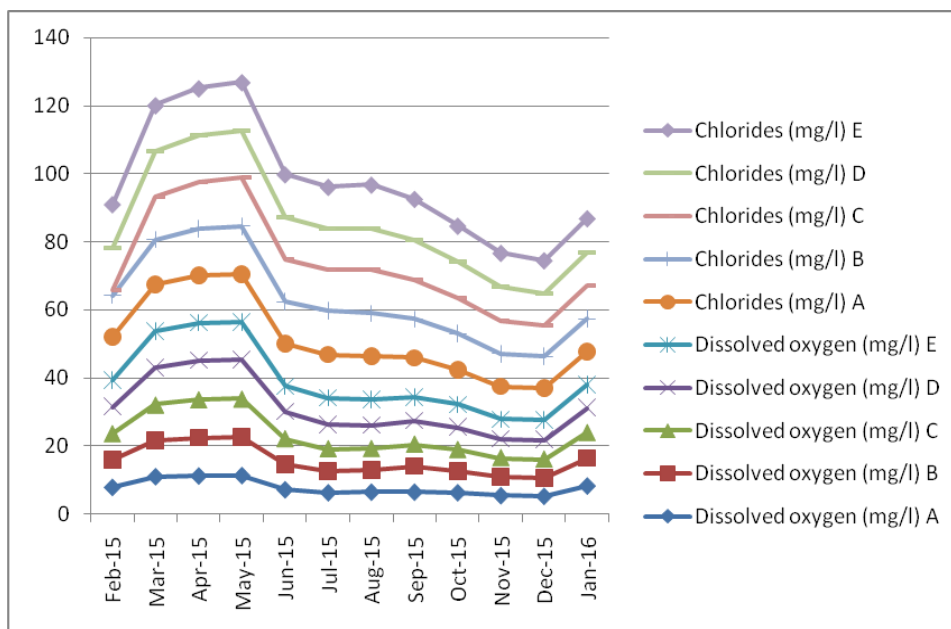


Fig 3: Dissolved oxygen and Chlorides of Uma River Basin

The variation in some physico-chemical parameters of Uma River Basin Dist. Washim (M.S.) during the period of Feb. 2015 to Jan. 2016 are represented in the table no. 1 to 6.

Water temperature: Water temperature is an important factor which influences the chemical, biochemical and biological characteristics of river water body. Water temperature ranges from 20.1 °C to 27.8 °C the maximum water temperature was recorded in the winter months and maximum in the summer months. Similar results were reported by Wankhade et al [1]. Observed that, higher water temperature in summer and lowers in winter.

pH: It was observed that pH of water is minimum during winter and higher in summer season. Throughout the study period, no large difference was found in pH values between the stations A to E. Ubharhande et al [5] were studied about the pH of Paintakli dam which shows similar results.

Turbidity: Turbidity of river water is caused by the suspended matter such as clay, silts finely divided organic and inorganic matter, plankton and other microscopic organisms. Silt gives the advantage that it gives advantage to check light penetration in water body. Result shows all the

five stations show different values for turbidity in all seasons. Similar results were obtained to about turbidity. [3].

TDS: During study period the total dissolved salts (TDS) was maximum in rainy season (343.5 mg/l) and was minimum during summer (127.4 mg/l). High value of TDS in rainy season may be due to water turbidity and copious quality rain water which brings down agricultural runoff. Similar results were obtained to Umadevi [6], during investigation of limnological aspects in Karanja River, Karnataka.

D. O.: During the study period it was observed that the value of D.O. fluctuates from 5.20 mg/l to 11.40 mg/l. The maximum values 11.40 mg/l was recorded in the month of May (summer) and minimum values 5.20 mg/l in the month of December. The high D. O. in summer is due to increase in temperature and duration of bright sunlight has influence on the % of soluble gases (O₂ & CO₂). Similar results were obtained to Manjare et al [7] during the period of 1st Jan 2009 to 31st Dec. 2009.

Chloride: During the period of investigation chlorides in the Uma River water ranged between 41 mg/l to 76 mg/l. the maximum values of chlorides recorded during monsoon

season while in summer less chloride content was detected. Thirumala et al ^[2] concluded in their observation that chloride values ranged between 9.0 to 14.03 mg/l Concentration of chloride were higher during summer season and minimum in rainy season

4. Conclusion

A study of some physico-chemical parameters of Uma River Basin Dist. Washim was carried out by taking some important parameters like temperature, pH, turbidity, TDS, DO, and chlorine for a period of one year (Feb. 2015 to Jan 2016).

In present investigation it was found that all parameters were within normal range. This indicates that Uma River Basin is non-polluted and river water can be used for domestic use and fish culture.

5. References

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