

## HYDROCHEMICAL PARAMETERS OF TWO RIVERS IN AKOLE TALUKA OF AHILYANAGAR DISTRICT OF MAHARASHTRA STATE

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DOI: <https://www.doi.org/10.58257/IJPREMS37881>

### ABSTRACT

Rivers are lifeline for the agriculture and all other many sectors in our country especially in rural areas of Ahilyanagar district of Maharashtra State. Which is totally having agro based economy therefore present work was undertaken to observe the difference in hydrochemical parameters of the water samples from Mula and Kurkundi rivers from Akole Taluka. It was observed that in Mula river the alkalinity was observed 270 to 410 mg/L, acidity was 15 to 20 mg/L, dissolved oxygen (DO) was 4.2 to 6.0 mg/L, carbon-di-oxide (CO<sub>2</sub>) 31.9 to 38.2 mg/L, hardness was 90.4 to 99.5 mg/L, pH was 6.4 to 7.4, temperature was 23 to 27 °C and TDS was 284 to 304. From Kurkundi river the alkalinity was observed 230 to 385 mg/L, acidity was 10 to 25 mg/L, dissolved oxygen was 3.5 to 6.6 mg/L, carbon di oxide 31.5 to 35.6 mg/L, hardness was 72 to 98.2 mg/L, pH was 6.9 to 7.3, temperature was 25 to 27 °C and TDS was 265 to 310. This study was undertaken from January 2024 to April 2024.

**Keywords:** Ahilyanagar, Mula, Kurkundi, hydrochemical parameters, agriculture

### 1. INTRODUCTION

In the hilly and remote areas of Akole taluka of Ahilyanagar district of Maharashtra State agriculture is the only and major source of livelihood and earning. It is very rainy area and rice is a major crop of that area. Paddy fields require high amount of water therefore it is very important to study its physicochemical properties. Water of Mula and Pravara rivers along with Krushnavanti and Kurkundi rivers have importance. Some literature is available on physicochemical parameters of Mula and Pravara river water but there is paucity of literature on Krushnavanti and Kurkundi river waters especially during post pandemic era therefore the present investigation work was undertaken. Magadum et al., (2017) assessed the physicochemical parameters and water quality of Vishwamitri river in Gujarat, India [1]. Few researchers in Maharashtra have studied on physicochemical parameters of river water in Maharashtra. Ashtanagar et al., (2023) evaluated the physicochemical parameters of Verna river in Wardha district of Maharashtra State and found the seasonal variations in physicochemical parameters [2]. Chaudhari (2020) have studied the physicochemical parameters of Godavari river Brahmagiri Nasik in Maharashtra State [3]. Dwivedi (2017) have studied the physicochemical characteristics of water in river Mandakini [4]. Salve et al., (2022) analyzed seasonal variations of physicochemical parameters from Godavari river basin at Kamalpur, Taluka Shrirampur, District Ahmednagar [5]. Solanki and Shrivastva (2021) also studied the Narmada water and found that most of the physicochemical characteristic of water samples are within the WHO limit [6]. Shrivastava et al., (2024) studied the physical and chemical parameters of Murna river water and found spatial variation in water quality across different sampling sites [7].

### 2. METHODOLOGY

Water samples were collected in January to April 2024 from Mula river and Kurkundi rivers and were analyzed using standard methods [8]. The pH was measured by using digital pH meter, temperature was recorded using thermometer, alkalinity, acidity, CO<sub>2</sub> and hardness were estimated by titrimetric methods, the dissolved oxygen was measured using Winkler's method and the TDS was measured using digital TDS meter [9].

### 3. RESULTS AND DISCUSSION

The observations and results found during the study period were combinely shown in the following Tables no. 1 and 2.

**Table 1:** Showing Physicochemical Parameters of Mula River water

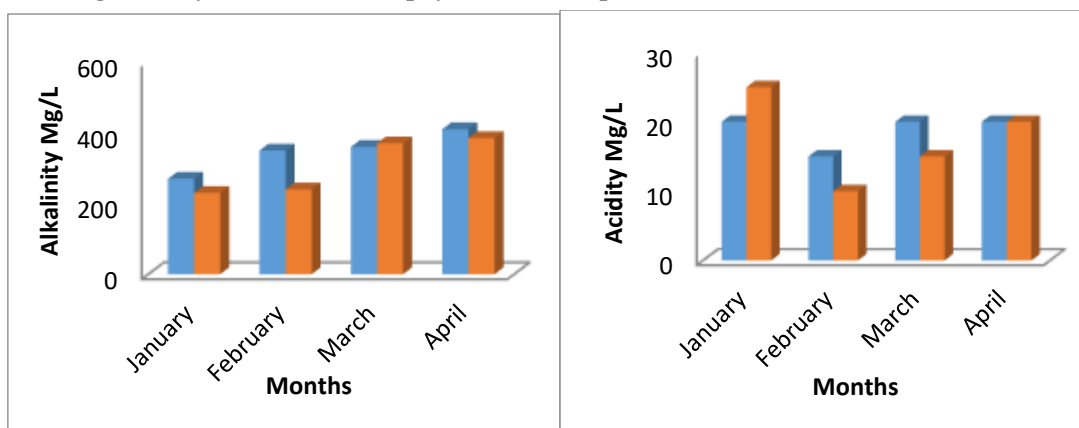
Month	Alkalinity (mg/L)	Acidity (mg/L)	DO (mg/L)	CO <sub>2</sub> (mg/L)	Hardness (mg/L)	pH	Temp. (°C)	TDS
January	270	20	6.0	31.9	97.4	7.2	23	290

February	350	15	5.8	34.8	99.5	7.4	25	304
March	360	20	4.6	38.2	95.6	6.8	27	284
April	410	20	4.2	35.0	90.4	6.4	27	300

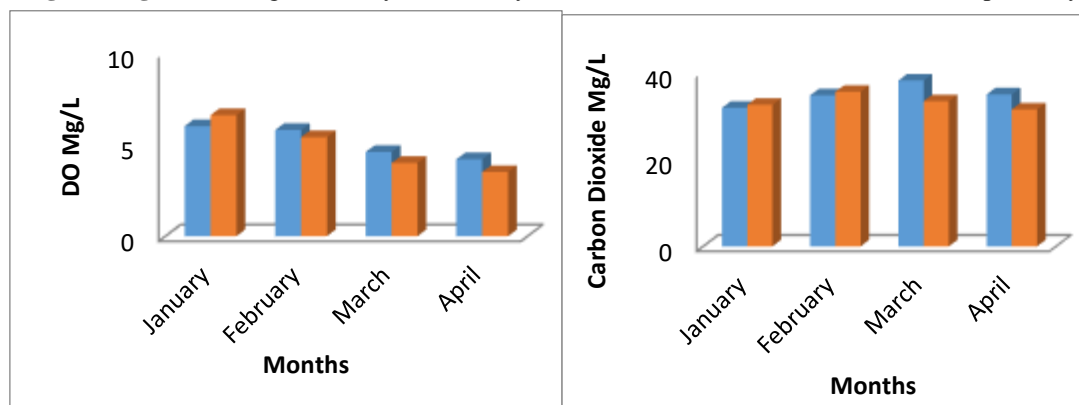
**Table 2:** Showing Physicochemical Parameters of Kurkundi River water

Month	Alkalinity (mg/L)	Acidity (mg/L)	DO (mg/L)	CO <sub>2</sub> (mg/L)	Hardness (mg/L)	pH	Temp. (°C)	TDS
January	230	25	6.6	32.6	72	7.1	25	310
February	240	10	5.4	35.6	82	7.0	25	270
March	370	15	4.0	33.4	96.4	6.9	26	282
April	385	20	3.5	31.5	98.2	7.3	27	265

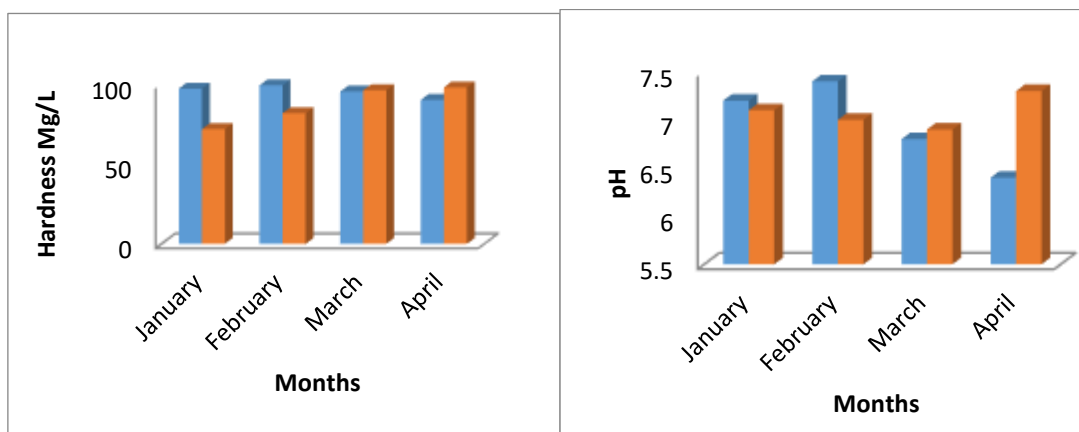
Graphs Showing monthly variations in the physicochemical parameters of Mula & Kurkundi River respectively



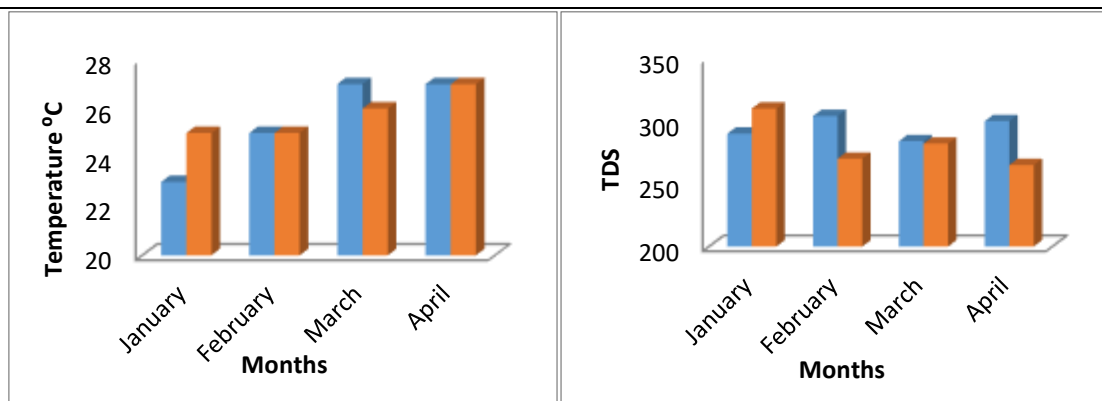
**Fig.1 & Fig.2:** Showing Alkalinity and Acidity content from Mula and Kurkundi river respectively



**Fig.3 & Fig.4:** Showing Dissolved Oxygen and CO<sub>2</sub> content from Mula and Kurkundi river respectively



**Fig.5 & Fig.6:** Showing Hardness and pH content from Mula and Kurkundi river respectively



**Fig.7 & Fig.8:** Showing Temperature and TDS content from Mula and Kurkundi river respectively

In the water of the Mula River, alkalinity was measured in January at 270 mg/L, February at 350 mg/L, March at 360 mg/L, and April at 410 mg/L; acidity in January at 20 mg/L, February at 15 mg/L, March at 20 mg/L, and April at 20 mg/L; dissolved oxygen in January at 6.0 mg/L, February at 5.8 mg/L, March at 4.6 mg/L, and April at 4.2 mg/L; carbon-di-Oxide in January at 31.9 mg/L, February at 34.8 mg/L, March at 38.2 mg/L, and April at 35.0 mg/L; hardness was 97.4 mg/L in January, 99.5 mg/L in February, March at 95.6 mg/L, and April at 90.4 mg/L; and temperature was 23 °C in January, 25 °C in February, 27 °C in March, and 27 °C in April. pH was 7.2 in January, 7.4 in February, 6.8 in March, and 6.4 in April. TDS levels were 290 in January, 304 in February, 284 in March, and 300 in April as shown in Fig.1-8. The levels of alkalinity in the Kurkundi River water were 230 mg/L in January, 240 mg/L in February, 370 mg/L in March, and 385 mg/L in April. January's acidity level was 25 mg/L. 10 mg/L in February, 15 mg/L in March, and 20 mg/L in April. January had 6.6 mg/L of dissolved oxygen, February had 5.4 mg/L, March had 4.0 mg/L, and April had 3.5 mg/L. January had 32.6 mg/L of carbon dioxide, February had 35.6 mg/L, March had 33.4 mg/L, and April had 31.5 mg/L. The temperature was determined to be 25 °C in January, 25 °C in February, 26 °C in March, and 27.0 °C in April. The hardness values were 72 mg/L in January, 82 mg/L in February, 96.4 mg/L in March, and 98.2 mg/L in April. pH was 7.1 in January, 7.0 in February, 6.9 in March, and 7.3 in April. TDS levels were 310 in January, 270 in February, 282 in March, and 265 in April as shown in Fig.1-8.

Gupta et al., (2017) observed that fall in quality of water in monsoon season was due to proper sanitation ,turbulent flow, soil erosion and human activities while studying quality of river water of Narmada river and effect of physicochemical and biological parameters on it [10]. Goyal and Shrivastava (2020) analyzed the Kharun river water in Raipur district in Chhattisgarh, India and found that the water of the river cannot be used without any treatment process [11]. Vijayan et al 2018 studied the physicochemical parameters of water samples of Cauvery river in Thanjavur district in Tamilnadu and concluded that there is monthly variation in them according to ecological influence [12]. Vyas et al 2018 have studied the water of Sonrakh river in Junagarh city in Gujrat for its physicochemical study [13].

#### 4. CONCLUSION

January month is representative of winter season March and April are representing summer season. Now a day it is observed that seasonal effect is not much effective due to hybrid seasons. In Summer or winter we are experiencing rains.

#### ACKNOWLEDGEMENTS

The authors are thankful to Honorable Principal of our college Prof. Dr. Arun H. Gaikwad and respected Head, Department of Zoology Prof. Dr. Vandana V. Bhavare for giving necessary permission and facilities to carry out the research work.

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