



Hydrochemical Parameters of Two Lakes in Sangamner Taluka, Ahilyanagar District of Maharashtra, India

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ABSTRACT

Lake water has great importance for various needs during non-rainy seasons especially in pathar region of Ahilyanagar district therefore the present study was undertaken. The water samples from two water storage lakes were collected in January to April 2023. The physicochemical parameters were analyzed from sampling spot 1 Sawargaon Ghule and sampling spot 2 Dhorwadi. The alkalinity was observed in the range of 270 to 390 mg/L, the acidity was 15 to 24 mg/L, dissolved oxygen was found 3.2 to 15.6 mg/L, hardness observed 82 to 114 mg/L, CO₂ in the range of 23 to 38.5 mg/L, Temperature was found between 24 to 27.4 °C, pH 7.7 to 8.6 and TDS was in between 300 to 410.

Keywords: Ahilyanagar, Sawargaon Ghule, Dhorwadi, physicochemical parameters.

Introduction

Lakes are helping in storage of water which will be useful for drinking for human and the domestic animals especially live stocks. Lake water is also useful for agricultural activities during non-rainy season especially in the draught affected pathar region of Ahilyanagar district. The water quality can be estimated by calculating various physicochemical parameters therefore the present study was under taken. Water samples from Sawargaon Ghule and Dhorwadi were collected and analyzed for water parameters. Kale et al., (2021) have analyzed the water sample of Terna reservoir, near Makhani, dist. Osmanabad in Maharashtra state of, India. Bhargavi and Aruna (2023) analyzed the physicochemical parameters of lake in Nizamabad district in Telangana state. Physicochemical water quality parameters of freshwater lake of Warangal district was studied by Rajani (2024) and found that the water can be used for home, irrigation and Pisciculture purpose as the physicochemical parameters were within the limit. Physicochemical characteristics of Ovali lake of Bhiwandi city in Thane district of Maharashtra state was studied by Ayare et al., (2020). Shivshankar and Seshikala (2024) studied the impact of physicochemical properties on waterbody in Kamauri Lake Shamshabad in Rangareddy. Premsudha et al., (2022) have evaluated the physicochemical parameters Hussain sagar and Saroor Nagar lake water quality in Hyderabad, Telangana India. Kale et al., (2019) have carried out analysis of water quality using physico-chemical character of lower Terna reservoir, near Makhani, district Osmanabad in Maharashtra, India.

Material and Methods

Water samples were collected in January – April 2023 from Sawargaon Ghule and Dhorwadi spots and analyzed using standard methods (Trivedi and Goel 1986; APHA, 2012). The pH was measured by using digital pH meter, temperature was recorded using thermometer, alkalinity, acidity, CO₂ and hardness were estimated by titrimetric methods, the dissolved oxygen was measured by using Winkler's method and the TDS was measured using digital TDS meter.

The observations were included in table monthwise and as per sampling spots. The variation in concentration of parameters were shown in graphs.

Result and discussion:

In the present study eight different water parameters were analysed and observations were shown in following table.

Table 1 - The result for sampling spot 1 and sampling spot 2 were recorded during the study period and tabulated in the following table.

Parameter	January		February		March		April	
	S1	S2	S1	S2	S1	S2	S1	S2
Alkalinity (mg/L)	380	270	385	280	360	390	340	370
Acidity (mg/L)	20	20	20	15	23	15	24	16.5
D. O. (mg/L)	12.6	15.6	8.85	9.25	8.0	4.92	5.2	3.2
CO ₂ (mg/L)	32	31.5	34	35	26	38.5	23	40
Hardness (mg/L)	85	85	110	82	108	100.2	115	100.4
Temp. (°C)	25	24	24.6	25.4	27	26.4	27.4	27.2
pH	8.4	7.7	7.9	7.8	8	8.3	8.6	8.0
TDS	300	350	360	410	350	390	340	360

(S1: Sampling Spot 1 Sawargaon Ghule, S2: Sampling Spot 2 Dhorwadi)

Graphs Showing month and spot wise variations in the physicochemical parameters.

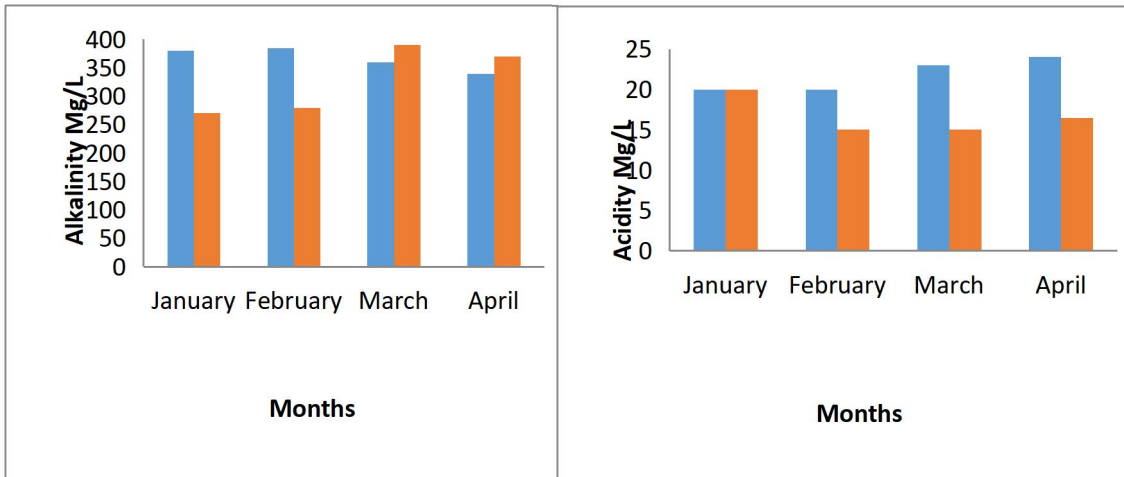


Fig.1 & Fig.2: Alkalinity and Acidity content from sampling spot 1 and 2 respectively

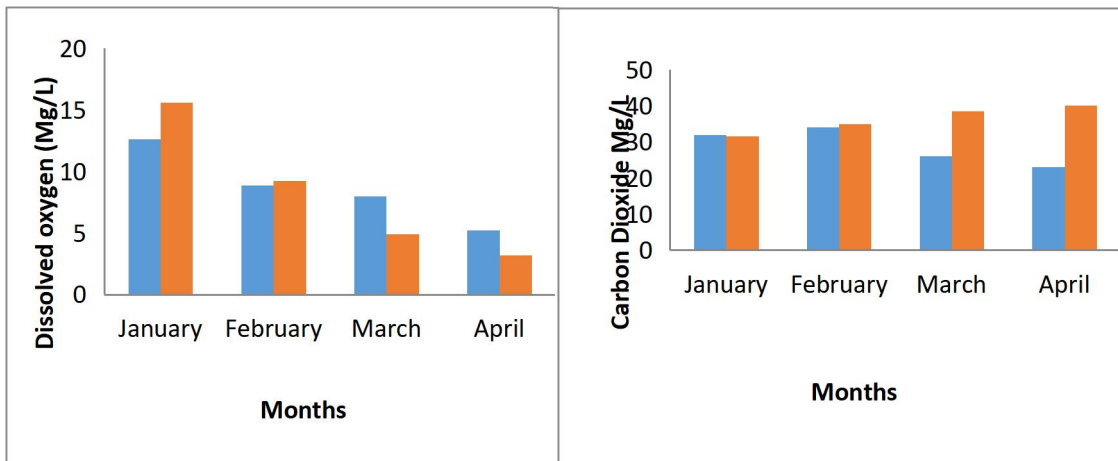


Fig.3 & Fig.4: D.O. and CO₂ content from sampling spot 1 and 2 respectively

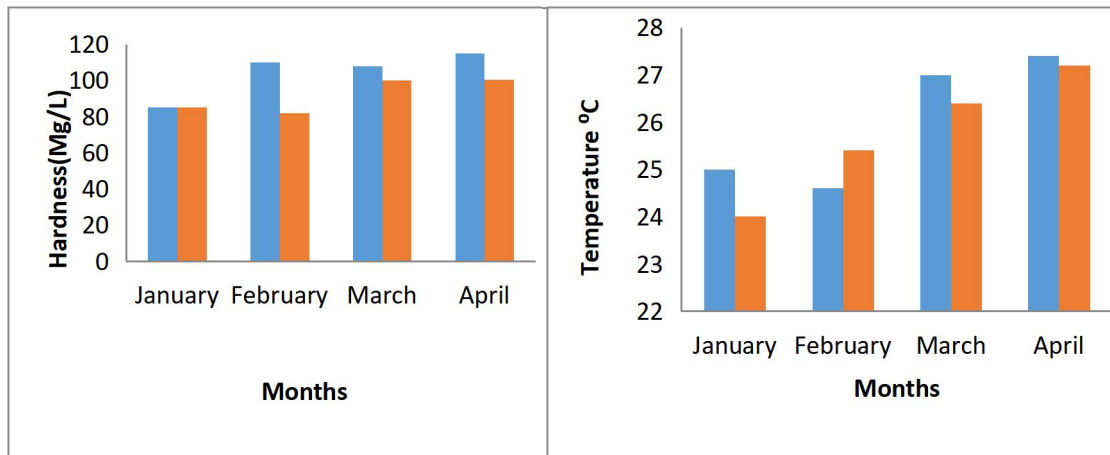


Fig.5 & Fig.6: Hardness and Temperature content from sampling spot 1 and 2 respectively

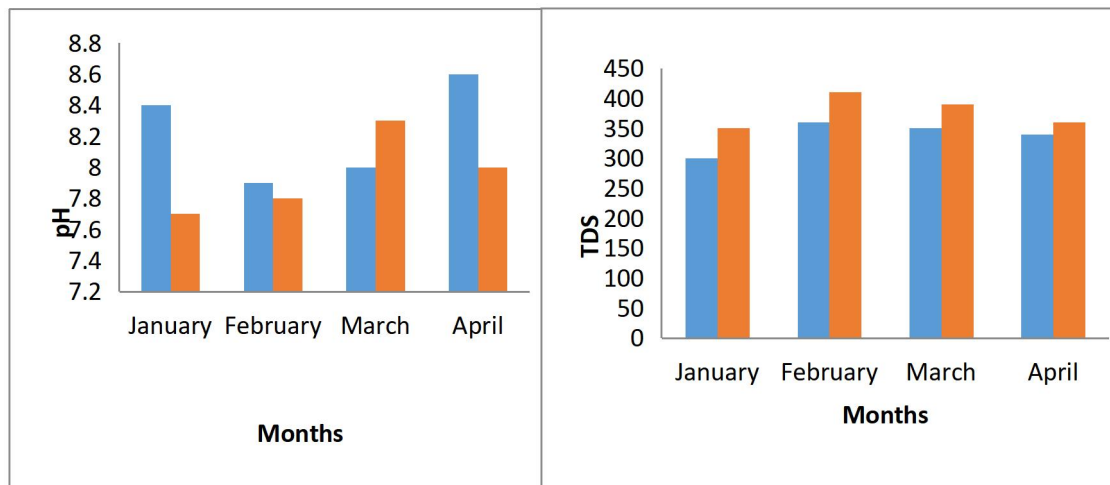


Fig.7 & Fig.8: pH and TDS content from sampling spot 1 and 2 respectively

Discussion

Alkalinity levels at Sawargaon Ghule sampling spot 1 were 380 mg/L in January, 385 mg/L in February, 360 mg/L in March, and 340 mg/L in April. January's acidity level was 20 mg/L. 20 mg/L in February, 23 mg/L in March, and 24 mg/L in April. January had 12.6 mg/L of dissolved oxygen (DO), February had 8.85 mg/L, March had 8.0 mg/L, and April had 5.2 mg/L. January had 32 mg/L of carbon dioxide, February had 34 mg/L, March had 26 mg/L, and April had 23 mg/L. The hardness levels were 85 mg/L in January, 82 mg/L in February, 108 mg/L in March, and 115 mg/L in April. The recorded temperatures were 25 °C in January, 24.6 °C in February, 27 °C in March, and 27.4 °C in April. pH 8.4 in January, 7.9 in February, 8.0 in March and in April it was 8.6 and TDS was detected 300 in January, 360 in February, 350 in March and in the month of April it was 340 as shown in Fig. 1 – 8.

At Dhorwadi sampling spot 2, alkalinity levels were 270 mg/L in January, 280 mg/L in February, 390 mg/L in March, and 370 mg/L in April. In January, the acidity was 20 mg/L, 15 mg/L in February, 15 mg/L in March and 16.5 mg/L in April. The levels of dissolved oxygen were 15.6 mg/L in January, 9.25 mg/L in February, 4.92 mg/L in March, and 3.2 mg/L in April. The levels of carbon dioxide were 31.5 mg/L in January, 35 mg/L in February, 38.5 mg/L in March, and 40 mg/L in April. The hardness levels were 85 mg/L in January, 82 mg/L in February, 100.2 mg/L in March, and 100.4 mg/L in April. The temperature was recorded at 24 °C in January, 25.4 °C in February, 26.4 °C in March, and 27.2 °C in April. The pH was 7.7 in January, 7.8 in February, 8.3 in March, and 8.0 in April. As seen in Figures 1–8, the TDS levels were 350 in January, 410 in February, 390 in March, and 360 in April. It was observed that much effect is not observed of seasons on these two spots. Potharaju and Aruna (2021) have analyzed the physicochemical parameters of Medchal lake in Telangana and they found that in some parameters there was significant variation and most of the parameters found to be in normal permissible limit and water of the lake was suitable for drinking purpose. Salve et al., (2022) studied Physico-Chemical Parameters of Godavari River Water from Kamalpur, Taluka Shirampur, District Ahmednagar and they observed that the water quality parameters concentration differs seasonally. Nagpurkar et al., (2023) have studied five selected lakes in Bhandara district of Maharashtra state and analyzed the water quality, physicochemical parameters and geospatial distribution. They found the water quality parameters apparently lower during post monsoon season which could be due to dilution of water. Bhagde et al., (2024) studied physicochemical parameters of two rivers from Akole taluka of Ahilyanagar district they concluded that seasonal effect is not much effective due to the changing environmental conditions.

Conclusion

At both the collection spots viz. at Sampling Spot 1) Sawargaon Ghule and Sampling Spot 2) Dhorwadi the physicochemical parameters were varying. It seems that the trends are not uniform means in increasing or decreasing as the season changes, this is because of change in environmental conditions.

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