PHYSICOCHEMICAL ANALYSIS OF PAVASI LAKE WATER OF TALUKA KUDAL DISTRICT SINDHUDURG (MS) INDIA

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Abstract:
In the present invstigation to understand the water quality of Pavasi Lake, Physicochemical parameters were studied and analysed for the period of one year i.e. June, 2015 to May 2016. Numbr of physicochemical parameters, such as Water temperature, pH, Dissolved oxygen and Total hardness Turbidity were studied. The results revealed that there was seasonal variation in some physico-chemical parameters and most of the parameters were in normal range and indicated better quality of lake water. It has been found that the water is best for drinking purpose, agricultural and industrial purpose after proper treatement.
Key words: *Physicochemical parameters, Pavasi Lake, water quality.*

Introduction

Pavasi lake is a located in Kudal Tahsil of Sindhudurg district in Maharashtra, India. It is 4 km away from Sawantwadi. The water from this Precipitation mostly flows down to Sea in the form of different rivers, however, the Substantial amount of water is also at Stored in Ponds and lakes found in this area .The available water resources for the use as water for irrigation drinking and aqua - Cultural point of view; they are grossly over looked as habitats and sources of biodiversity. Water is one of the most important factors for all living organisms, imagine a form of life that can impossible without water. Approximately 71% of the earth surface covered by water in the form of oceans, glaciers, fresh water bodies, rivers, wells, lakes (Patel and Patel, 2012; Nirmala et al 2012). Water quality generally means the component of water which must be present for optimum growth of aquatic organisms. The productivity depends on physico-chemical characteristics of the water body. The determinant of good growth in water body includes dissolved oxygen, hardness, turbidity, alkalinity, nutrients, temperature, etc. However, the water of the ponds, lakes and river is polluted mainly due to discharged waste water from residential areas, sewage outlets, solid wastes, detergents, automobile oil wastes, fishing facilities and agricultural pesticides from farmlands (M.M. Bhat, *et.al,* 2012). Water resources are declining day by day at the faster rate due to rapid urbanization and population load. Deterioration of the water quality is now a very big problem. Hence, the present study was conducted to study the physico-chemical properties of Pavasi lake water.

MATERIALS AND METHODS

The water samples from Lake were collected from sampling stations during June- 2015 to May- 2016 at early morning. Samples were collected at monthly interval in plastic cans of two litres capacity. Water temperature, pH recorded at sampling station. Remaining parameters were analysis in the laboratories. Collected water samples were brought immediately to the laboratory for the estimation of various physicochemical parameters like, Dissolved oxygen, Total Hardness, Calcium hardness, Magnesium

hardness and Chloride, Turbidity. Physicochemical parameters were analysed as per standard methods suggested by Trivedy and Goel (1986), APHA (1992) and IAAB (1998).

Table No. 1 Methodology for the analysis of Physico-chemical parameters of Madkol lake water.

Sr. No	Parameter	Method	Reference
1	Water Temperature	Thermometer	Biocraft Water analysisi Kit
2	pH	Hann's pH metr	=======
3	Dissolved Oxygen	Wrinkler's method	APHA, 1980, IAAB, 1998, Trivedy and Goel, 1998
4	Total Hardness	Titrometry	APHA, 1980, IAAB, 1998, Trivedy and Goel, 1998
5	Calcium Hardness	Titrometry	APHA, 1980, IAAB, 1998, Trivedy and Goel, 1998
6	Magnisium Haardness	Titrometry	APHA, 1980, IAAB, 1998, Trivedy and Goel, 1998
7	Chloride	Titrometry	APHA, 1980, IAAB, 1998, Trivedy and Goel, 1998
8	Turbidity	Spectrophotometric method	APHA, 1980, IAAB, 1998, Trivedy and Goel, 1998
9	Conductivity	Conductometer	APHA, 1980, IAAB, 1998, Trivedy and Goel, 1998

Results and Discussion

The physicochemical parameters of the Kudal Lake have been represented in the Table 1 and graphically represented in the fig no. 1-7 and seasonal variation of Pavasi lake Kudal District Sindhudurg are represented in Table no.2. The physicochemical features of Pavasi lake water were influenced due to the discharge of domestic waste and agriculture at discharges.

Water Temperature: The water temperature was recorded between 22 oC to 31oC. The temperature is one of the important factors in aquatic environment since it regulates physicochemical as well as biological activities (Kumar et al., 1996). In the present investigation the water temperature was recorded 20.5 oC to
28.9 oC. Higher temperature was recorded

in June 28.9 oC. Wanjari H.V. and O.G. Tanpure (2020) Studied on Adol dam, Washim and reported that the maximum temperaturewas observed at Adol Dam 26.816±25.184. Similar valuewere recorded by Soni, *et al.*(2016).

Table no. 2 Seasonal variation of physicochemical parametrs of Madkol Lake Water of Sawantwadi June- 2015 to May- 2016.

Parameter/ Months	Water Temperature	pH	Dissolved oxygen	Total hardness	Calcium Hardness	Magnisium hardness	Chlorides	Conductivity Mmhos/m^2	Turbidity J.T.V.
June	28.9	7.8	7.6	121.31	24.33	14.03	40.12	0.475	25.10
July	27.2	7.8	7.7	132.32	18.05	16.51	42.17	0.465	45.21
August	27.1	7.5	7.4	118.41	18.07	18.77	40.01	0.350	19.45
September	26.2	7.8	7.5	102.36	14.59	12.09	32.13	0.354	35.25
October	22.5	7.6	7.8	101.02	15.02	15.99	31.17	2.030	34.50
November	24.9	7.4	7.6	98.62	18.99	13.17	26.05	2.039	32.41
December	20.5	7.9	7.3	103.26	19.55	13.97	24.11	1.984	32.40
January	22.1	8.2	8.8	114.24	21.77	14.07	28.13	2.302	29.85
February	22.4	8.1	8.6	121.66	19.8	16.15	40.11	0.320	28.36
March	26.1	7.9	7.5	123.62	17.03	19.11	38.13	0.353	27.50
April	27.1	7.8	7.3	127.17	23.07	11.12	44.17	0.308	26.50
May	28.2	7.3	7.8	121.21	26.33	18.23	48.15	0.457	25.70

All parameters are express in mg/liter except water temperature and pH.

Fig no. 1. Monthly variation of water temperature during 2015-2016.

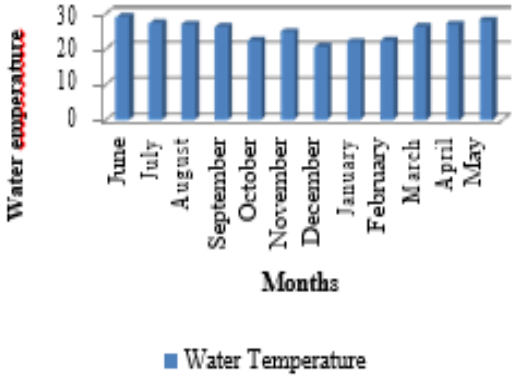


fig. no 2. Monthly variation of pH during 2015-2016

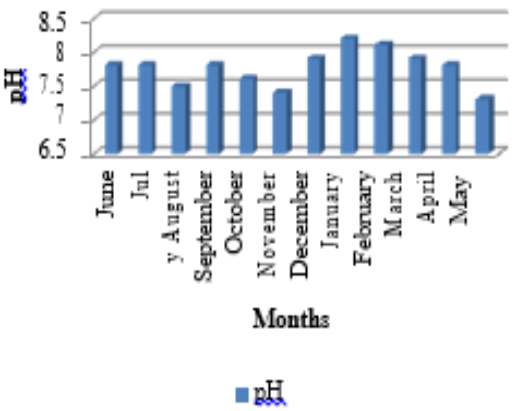


fig. no. 3 Monthly variation of Dissolved oxygen during 2015-2016

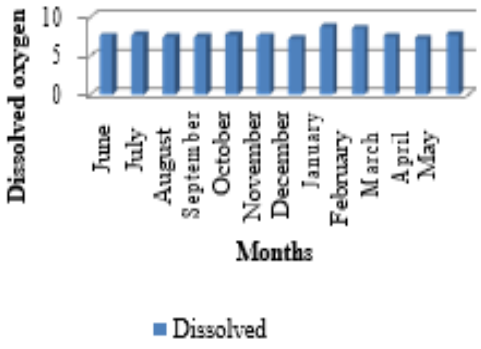


Fig. no. 4 Monthly variation in dissolved oxygen during 2015-2016.

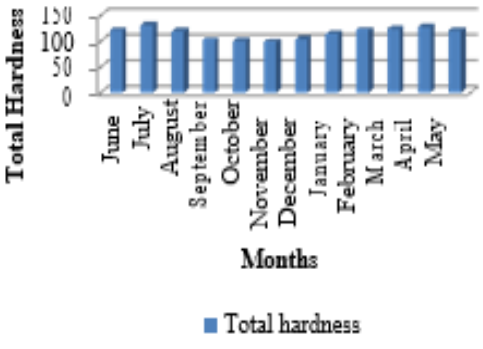


Fig. No. 5 Monthly variation in Calcium Hardness during 2015-2016

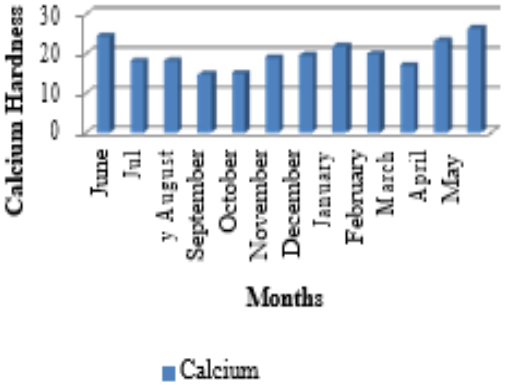
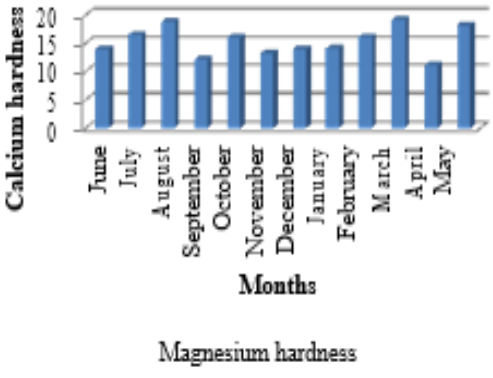
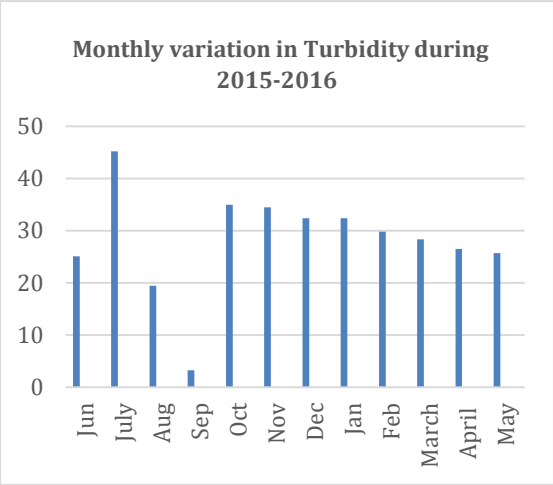
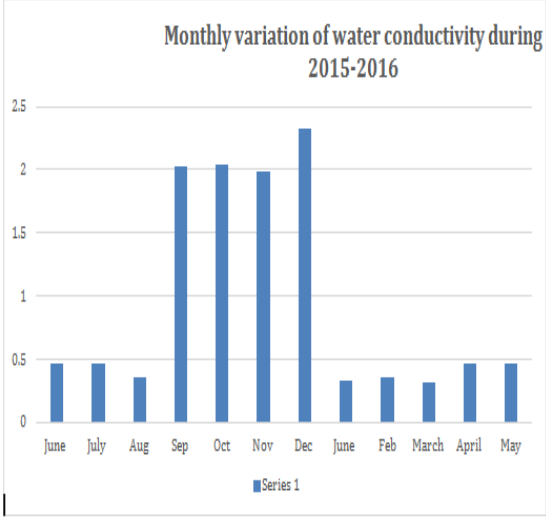
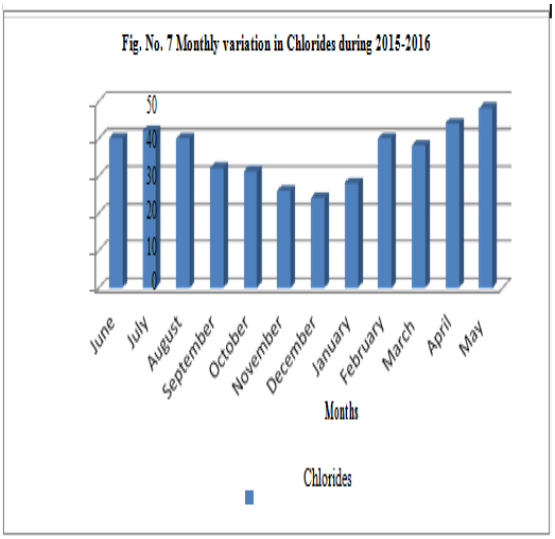


Fig. no. 6 Monthly variation in Magnisium hardness during 2015-2016.









pH: The pH ranged from 7.4 to 8.2 mg/lit. pH was minimum in December and maximum in June. The pH was found in the range of 7.1 to 8.4. Bhagde *et.al*. (2020) studied on Physicochemical parameters of small lake Sangamner, Maharashtra and reported that the minimum was at Dhorwadi and Pemgiri in monsoon season and maximum at Pimpalgaon Depa in the summer season. Manjare *et.al* (2010) studied on physico-chemical parameters tamdalge tank in kolhapur district, maharashtra and reported that the pH was alkaline values ranges from 7.3 to 8.8. The maximum pH value (8.8) was recorded in the month of May (summer) and minimum (7.3) in the month of September. The factors like air temperature bring about changes the pH of water. Most of bio-chemical and chemical reactions are influenced by the pH. The reduced rate of photosynthetic activities reduces the assimilation of carbon dioxide and bicarbonates which are ultimately responsible for increase in pH, the low oxygen values coincided with high temperature during the summer month Kamble, *et.al* (2009). Rohini, A. and Manikya Reddy, P.(2020) Satudied on Physico-Chemical Studies on Safilguda Lake, Hyderabad and reported that the alkalinity with an average pH of 8.4. Carbonates ranged from 6.0 to 48.0 mg/L and bicarbonates were present in the range of 132.0 to 295.67 mg/L indicating alkaline nature of the lake.Alkalinity of lakes were reported by Amin Hossaini Motlagh et.al (2013) working on Mir Alam Lake in India. The pH and carbonates are directly related and both

are inversely proportional to bicarbonates Nirmala,K. (2011). Wanjari H.V. and O.G. Tanpure (2020) Studied on Adol dam, Washim and reported that the pH value is recorded 8.25±6.92 which was maximum in five months seasonal variations.

Dissolved Oxygen: The dissolved oxygen concentration ranged from 7.3 to 8. 8 mg/lit. Dissolved oxygen was minimum in December and maximum in January. Eariler workers also observed similar trend of dissolved oxygen in fresh water lakes. (Bhatt *et al.*, 1998 Pandey, 1993). Bhagde *et.al*. (2020) studied on Physico-chemical parameters of small lake Sangamner, Maharashtra and reported the dissolved oxygen was found in the range of 5.1 mg/L to 7.9 mg/L. The minimum was at Dhorwadi in the summer season and the maximum was at Pokhari Baleshwar in the winter season. Manjare *et.al* (2010) studied on physico-chemical parameters tamdalge tank in kolhapur district, maharashtra and reported that the values of DO fluctuates from
6.40 mg/l to 15.5 mg/l. The maximum values (15.5 mg/l) was recorded in the month of May (summer) and minimum values (6.40 mg/l) in the month of November (winter). The high DO in summer is due to increase in temperature and duration of bright sunlight has influence on the % of soluble gases (O^2 & Co^2). The long days and intense sunlight during summer seem to accelerate photosynthesis by phytoplankton, utilizing Co2 and giving off oxygen. This possibly accounts for the greater qualities of O2 recorded during summer. The quality is slightly lesser during winter, reported by Masood Ahmed and Krishnamurthy R.(1990). Rohini, A. and Manikya Reddy, P.(2020) Saudied on Physico-Chemical Studies on Safilguda Lake, Hyderabad and reported that the DO is a most important indicator of water quality and is of great importance to all the aquatic organisms. Safilguda lake has very low DO. The minimum and maximum DO values observed were 1.6 to 4.0 mg/L. D0 shows an inverse correlation to organic matter and water temperature [6]. Organic matter showed higher value than DO ranging between 1.9 mg/L to 7.5 mg/L. Wanjari H.V. and O.G. Tanpure (2020) Studied on Adol dam, Washim and reported that the maximum value of dissolved oxygen was found 5.095±4.905. The maximum and minimum value of dissolved oxygen was found in the month of August and December respectively.

Total Hardness: The total hardness concentration ranged from 98.62 to 132.32 mg/lit. Total hardness was minimum in November and maximum in July. Bhagde *et.al*. (2020) studied on Physico-chemical parameters of small lake Sangamner, Maharashtra and reported the hardness was in the range of 58 mg/L to 140 mg/L. The minimum was at Dhorwadi in monsoon season and the maximum was at Dhorwadi and Pimpalgaon Depa in the summer season. Manjare *et.al* (2010) studied on physico-chemical parameters tamdalge tank in kolhapur district, maharashtra and reported that the value of hardness fluctuates from 70 mg/l to 179mg/l. The maximum value (179 mg/l) was recorded in the month of April (summer) and minimum value (70 mg/l) in the month of October. Hujare, M.S. (2008) was reported total hardness was high during summer than monsoon and winter. High value of hardness during summer can be attributed to decrease in water volume and increase of rate of evaporation of water. Similar results were obtained in

the present study. Rohini, A. and Manikya Reddy, P.(2020) Satudied on Physico-Chemical Studies on Safilguda Lake, Hyderabad and reported that the concentrations of calcium at station I, station II and station III were 43.3 mg/L, 35.9 mg/L and 26.12 mg/L whereas magnesium were 20.2 mg/L, 9.5 mg/L and 13.8 mg/L. Saluja, D. S.(2020) reported that the hardness of water is not a pollution parameter but indicates water quality reported by Padma Priya K.T. (2015). Wanjari

H.V. and O.G. Tanpure (2020) Studied on Adol dam, Washim and reported that the maximum value of total hardness was found to be 316.32±283.67 mg/l. The maximum value of hardness was found to be in month of August and the minimum value 138.29±127.70 of hardness was found in the month of august.**Calcium Hardness:** The calcium hardness concentration ranged from 14.59 to 26.33 mg/lit. Calcium hardness was minimum in September and maximum in May. Wanjari H.V. and O.G. Tanpure (2020) Studied on Adol dam, Washim and observed that the value of calcium hardness in the month of October and November 112.29±111.64 while the lowest value was found to be in the month of December111.70±109.79.

Magnisium Hardness: The magnisium hardness concentration ranged from 11.12 to 19.11 mg/lit. Magnisium hardness was minimum in April and maximum in March. The magnesium is also an important parameter of water which shows the water quality. Wanjari H.V. and O.G. Tanpure (2020) Studied on Adol dam, Washim and reported that the minimum and maximum value of magnesium was found to be 206.42±172.11 and 26.54±15.49 respectively. The present study was supported with Mohamed (2005),at ABUZa'Baal ponds, Egypt.

Chloride: The chloride concentration ranged from 24.11 to 48.15 mg/lit. chloride was minimum in September and maximum in May. Manjare et.al (2010) studied on physico-chemical parameters tamdalge tank in kolhapur district, maharashtra and reported that the values of chlorides range from 31.06 mg/l to 57.61 mg/l. The maximum value (57.61 mg/l) was recorded in the month of May (summer) and minimum value (31.06 mg/l) in the month of February. In the present study maximum value of chloride reaches in summer. Similar results were reported by Swarnalatha and Narsing rao (1998). Rohini, A. and Manikya Reddy, P.(2020) Satudied on Physico-Chemical Studies on Safilguda Lake, Hyderabad and reported that the average values of chlorides were 201.25 mg/L at station I, 238.62 mg/L at station II and 233.11 mg/L at station III. Ameetha Sinha et.al (2014) reported that the high concentration of chlorides indicates water pollution. Sources of chloride in water are sewage and industrial effluents.

Turbidity: It is caused by particles suspended or dissolved in water that scatter that light making the water appear cloudy or murky particulate.

Coductivity: It is numerical expression of ability of sample to carry an electrical current. It is depends on concentration of substance dissolve in water and temperature. As a most of salt are present in ionic form capable of conductivity. Current conductivity is good and rapid.

CONSLUSION

The result revealed that there was significant seasonal variation in some physicochemical parameters and most of the parameters were in the normal range and indicates better quality of lake. The

Lake water may be used for the agricultural purposes, industrial purposes and aquacultural activities. For the purpose of drinking water to used after proper treatment.

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