

Physico-chemical analysis of Purna river water from Asegaon Purna of Dist.Amravati, Maharashtra.

Khalokar Sapana P.

Research student,

Department of Zoology,

Shri.Shivaji Science College, Amravati.

Abstract :

Physico-chemical characteristics of Purna river water affect the biological characteristics and indicate the status of water quality analysis of river water. Present investigation deals with the assessment of Physico-chemical parameters of water sample of Purna river at Asegaon Purna station of Amravati district during August 2015 to September 2016. correlation coefficients were calculated between different parameters to identify the highly correlated and interrelated water quality parameters and significant levels were calculated. The observed values of different Physico-chemical parameters includes water Temperature, pH, Conductivity, Total dissolved solids, Dissolved Oxygen, Carbon dioxide, Total Alkalinity, Total Hardness, Calcium Hardness, Magnesium Hardness, Chloride, Phosphate, Sulphate, Nitrate, Silicate. Observed values were compared with standard values recommended by world health organisation (WHO). Water is therefore, unsafe for drinking purpose.

Keywords : Purna River, Physico-chemical parameters and Water quality.

Introduction :

Mostly fresh water bodies are the finite source of water for living organisms. but now a days it is quite difficult to get safe water because of industrial, agricultural pollution and human activities, it shows the effect on water quality and its user and those living organisms which can live within freshwater. safe water is very essential for healthy life. but now a days satisfactory supply and the protection of water from any contamination is the first life of defence against infection and disease to treat contaminated water supply to render is suitable to for consumption (WHO, 1993).

Water is not very complicated substance chemically but its unique physical and chemical properties are responsible for the existence of on this planet. The properties of water provides framework and parts of method for the interacting with living processes. In recent years, environment monitoring through regular assessment of water quality has become a crucial factor of conservation of aquatic resources. (Pradhan 2014). Human activities, run off from agriculture, pollution from septic system and sewers increase the flux of both inorganic nutrients and organic substance into terrestrial, aquatic and coasted marine system (Sura et.al., 2010). the effect of pollution on trophic and toxic level of water can be detected, estimated and quantified by physicochemical methods (Warhade and Chavan, 2011).

According to Karanth (1989), inadequate management of water resources has directly or indirectly resulted in the degradation of hydrological environment. therefore, regular monitoring of Physico-chemical parameters of freshwater is essential to determine the status of river. The implementation of the water quality is a need of time. therefore, present study is focused on the study of Physico-chemical parameters and water quality of Purna river.

Materials And Method:

Monthly Water samples were collected from AsegaonPurna stations of Purna river:

Present ecological study is carried out on the basis of monthly variations from August 2015 to September 2016 of Purna river in Amravati district, Maharashtra from the station AsegaonPurna. Monthly samples were collected from the different stations of Purna river in a plastic bottle. Purna River is a freshwater lotic system passes through saline belt of Amravati district.

The Physico-chemical parameters like Water temperature, PH, Conductivity, Dissolved oxygen, Free CO₂, Total Hardness, Calcium hardness, Magnesium hardness, Alkalinity, Total Dissolved Solids, Chloride, Phosphate, Sulphate, Nitrate, Silicate. All the parameters were examined by methods suggested by APHA(2001). Temperature and pH of water samples were measured at the time of collection site. All generated data were analysed statistically by calculating mean value with acceptable standards.

Result and Discussion:

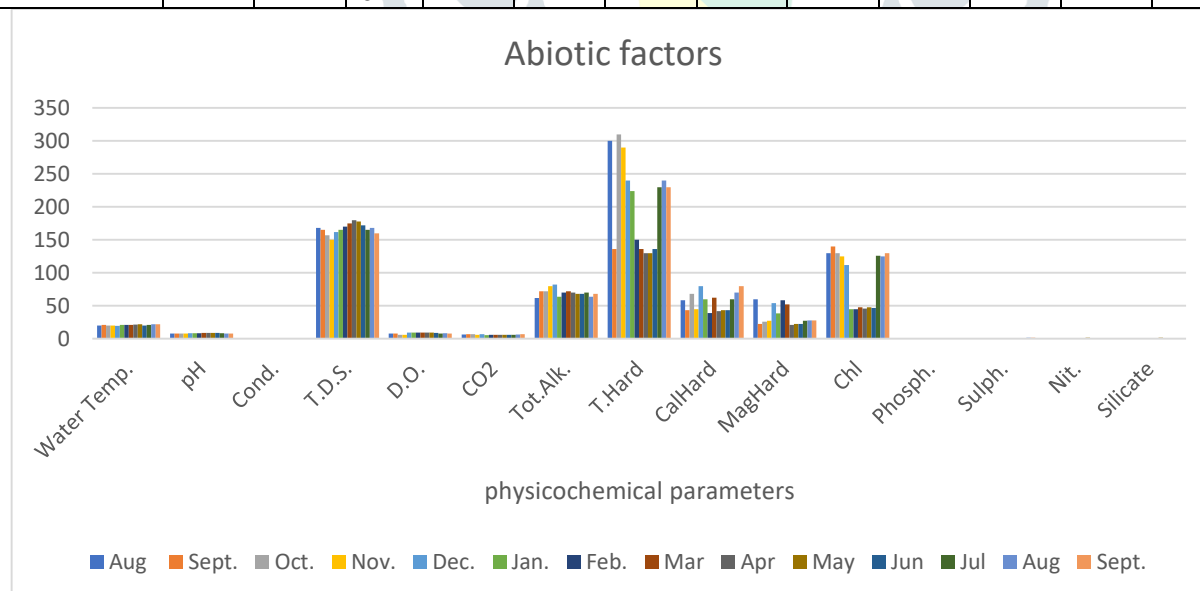
In the present investigation, the observations of physicochemical parameters are presented in the Table no. 1. The values inputted in the given table are compared with WHO standards (2004). The observation table shows the ranges of various parameters. The minimum water temperature is observed in the month of December 19.8 °C and maximum in May 22°C due to seasonal variation, pH minimum value is found in the month of September 7.82 and maximum value in the month of May 8.94, conductivity shows the minimum value in May 0.1 and maximum in January 1.0, minimum value of T.D.S. was found 150 mg/l in the month of November and maximum value 178 mg/l was found in the May. Dissolved oxygen shows the minimum value 6.0 mg/l in the month of October and maximum in the month of 9.2 mg/l in the month of December, January and February (table 1). CO₂ shows the minimum value in January 5.40 mg/l and 6.8 mg/l maximum value in December. Total alkalinity shows the maximum value in December 82 mg/l but minimum in the month of August 62 mg/l. Total hardness shows the minimum value 224 mg/l and maximum 310 mg/l in the month of January and October, respectively. Calcium hardness shows maximum value was 80 mg/l and minimum was 38.80 mg/l in September and February respectively. Magnesium hardness shows the maximum value was found 60 mg/l in August and minimum 21 mg/l in April, Chloride maximum value was found 140 mg/l in September and minimum value was 45 mg/l, Similarly, the maxima and minima ranges of phosphate lies in between (0.30-1.30) mg/l, Sulphate (0.40-1.60) mg/l, Nitrate (0.50-1.50) mg/l and Silicate (0.80 - 1.50) mg/l. as mentioned in table 1.

From the present investigation, it reveals that water temperature fluctuates with ambient temperature and establishes a direct relationship. This is in agreement with the findings of Munawar (1970); Day and Hazra (2005) as shown in table 1. The increase in summer and decline in winter indicated that there is a close relation between air and water temperature. This is supported by Sreenivasan (1964); Hassainy (1969); Kannan and Jog (1980) in tropical impoundments. In the monsoon season and comparatively showing lower water temperature it might be due to low atmospheric temperature. In the present study pH values from 7.82 to 8.94 were recorded in summer and minimum in the rainy season similarly as Surve (2005). Conductivity was found minimum in summer and maximum in winter and rainy season. The minimum value of T.D.S. was found in the November month and maximum in May. Similar results have been reported by Sangpal et al. (2011). Average value of D.O. was counted 6.0 mg/l to 9.2 mg/l was minimum in the October season and maximum in post summer. Alkalinity of water was found 62 mg/l and 82 mg/l in the month of August and December respectively. This value is found magnesium hardness average value was found to be 21 mg/l to 60 mg/l fluctuating during winter and monsoon season reported by Venkateshwaru et al. (2002).

TABLE 1: Monthly variation in Physico-chemical parameters of Purna River at AsegaonPurna station During 2015-2016.

Denote: Water temperature- °C and other parameters in mg/l.

Months/ Parameters	Aug	Sept	Oct	Nov	Dec.	Jan.	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sept
Watertemp.	20	21	19.9	20.0	19.8	21.0	21.0	21.0	21.5	22.0	20.0	21.0	22.0	22.0
pH	7.74	7.82	7.86	7.97	8.43	8.47	8.68	8.72	8.87	8.94	8.81	8.28	7.92	7.83
Cond.	0.3	0.02	0.03	0.02	1.0	1.0	0.3	0.2	0.2	0.1	0.2	0.3	0.2	0.3
T.D.S.	168	165	157	150	162	165	170	175	180	178	172	165	168	160
D.O.	8.0	8.0	6.0	6.0	9.2	9.2	9.2	9.2	9.2	9.2	8.8	8.0	8.4	8.0
CO ₂	6.7	6.8	6.8	6.2	6.8	5.40	6.0	6.2	5.80	5.90	6.2	6.2	6.7	6.8
Tot.Alk.	62	72	72	80	82	64	70	72	70	68	68	70	64	68
T.Hard	300	136	310	290	240	224	150	136	130	130	136	230	240	230
CalHard	58.40	43.20	68.00	45.00	80.00	60.00	38.80	62.30	42.00	43.20	43.20	60.00	70.00	80.00
MagHard	60.00	22.51	26.00	27.60	54.00	38.40	58.36	52.00	21.00	22.51	22.51	27.60	28.04	28.00
Chl	130	140	130	125	112	45	45	48	46	48	47	126	125	130
Phosph.	0.40	0.50	0.40	0.30	0.30	0.40	0.70	0.80	1.10	1.30	0.90	0.70	0.40	0.50
Sulph.	0.40	0.60	0.50	0.70	0.70	0.80	0.90	0.90	1.10	1.30	1.40	1.40	1.50	1.60
Nit.	0.50	0.60	0.70	0.70	0.80	0.90	1.20	1.40	1.30	1.50	1.40	0.90	0.80	0.80
Silicate	0.90	0.80	0.80	1.00	1.10	1.30	1.20	1.40	1.40	1.50	1.40	1.20	0.90	0.80

**Graph Showing the monthly variations in physico-chemical parameters of Purna river at AsegaonPurnastation.**

Conclusion:

From the present investigation it is concluded that the environmental factors and seasons are responsible for the variation of Physico-chemical parameters of water in Purna river. This river is used for drinking, fishing, irrigation and other domestic purposes. This study would help the water quality monitoring purposes. It can be concluded that due to the disposal of garbage, sewage water and founding contamination in samples water is not potable for drinking without purification.

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