PHYSICO-CHEMICAL INVESTIGATION OF RIVER PENGANGA AT KODSI VILLAGE, TALUKA KORPANA, DISTRICT CHANDRAPUR (M.S.) INDIA.

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Abstract:
Penganga is a one of the major source of water for domestic and irrigation use for people and commonly known as Painganga. The present investigations are preliminary attempt to study the Physico-Chemical parameters of River Penganga.Physico-chemical Parameters like Temperature, pH Conductivity, D.O., Free CO2, Alkalinity, Hardness and Total solids have been studied for about six month duration from April 2014 - September 2014 at two sites. Measured values are compared with standard values suggested by WHO and it is observed that River Penganga showing various seasonal fluctuation which leads to the deterioration of River water. It may be due to the human interfere specially discharge of domestic and agricultural waste in water.
Keywords: River Penganga, Korpana Taluka, Physico-Chemical parameter.

Introduction

As water is a basic ingredient of entire life cycle. It is a primary necessity of living and non- living system. It is estimated fact that fresh water is a natural resource of living process. Mainly river water can play important role in the developmental programme of any country.Water plays a vital role in different activities and it has a great socio-economic value and ultimately has effect on human Health (Kesre,2011). The balanced ecosystem is dependent on the Physico-Chemical parameter of water (Venkateshraju *et.al.,* 2010).Due to the rapid increase in population, industrialization etc. the quality of water has been deteriorating at drastic level due to the contamination of various disposal like sewage, industrial waste, agricultural waste etc. which ultimately results in depletion of aquatic biota hence water quality is a global problem. (Mahananda,2010).

Study Area : In Maharashtra state, Korpana is a taluka place in the district Chandrapur,located at the South-Western area of the district Chandrapur.Penganga is the chief river of Chandrapur district of Maharashtra. River Penganga is originated from Ajantha mountain and running towards Eastern part of Maharashtra state up to Chandrapur district.It enters Korpana Taluka at Kodsi village and a small Vidarbha river merged with Penganga river at village Deurwada from western side.No previous study has been done at suggested sites. Hence present study will considered to examine the Physico-Chemical characteristics of river Penganga at Kodsi to determine suitability of water for different purpose to mankind.

Materials and Methods

For present Investigations two sampling sites were selected at Kodsi village downstream. Surface water samples were collected once in a month from river Penganga for about six month from April 2014 to September 2014. Samples were collected from sites S1 & S2 between 9 a.m.-11 a.m.and parameter like Temperature,pH,Conductivity were measured at the sampling site by using portable water analysis kit and for Chemical parameters analysis samples were transported to the laboratory immediately. The assessment of Physico-Chemical parameters were done as per Standered methods given by APHA(1998), NEERI (1986).

Results and Discussion

The measured data for various Physico-Chemical charecteristics of the River Penganga At Kodsi village after monthly analysis during the period of April 2014 to September 2014 at site S1 & S2 are given below in the Table No.1& 2.

1.Temperature
It is one of the important parameter of water which affect growth and distribution of aquatic ecosystem. In present study temperature of river Penganga at site S1 ranged from 27.90^0C to 34.10^0C and 28.10^0 C to 34.12^0 C at Site S2. Highest value was recorded in the month of May at site S2, due to environmental temperature in summer and lowest value was in the month of September at site S1. It may be due to late monsoon season. Present observation are similar to the seasonal fluctuation in temperature studied by Sharma *et,al.* (2007) Table-1 and 2.

2. pH

pH indicate the acidic or alkaline nature of water. It is the measure of H^+ ion in water. Various biological processes are dependent on pH value. The observed pH value at site S1 ranged from 7.48 to 8.25 and 7.42 to 8.08 at site S2. It is Minimum in April and maximum pH in winter may be due to the discharge of domestic sewage and other waste into river. Deshmukh and Ambore (2006) Observed the same pattern of fluctuation in Godavari river, Nanded. During the study period it is observed that Penganga river maintain well alkaline nature of water and the values are within the permissible limits suggested by WHO (1991).

3. Conductivity

Conductivity is the measure of the capacity of aqueous solution to carry out the electrical current (Parshuram & Singh (2007). It depends on the concentration of ions, ionic mobility and temperature. Conductivity of river Penganga at site S1 ranges between 0.268μmhos/cm to 0.343μmhos/cm and 0.273 μmhos/cm to 0.306 μmhos/cm at Site S2. High value of conductavity in summer at Site S1,S2 it may be due to high concentration of domestic waste and low flow of river, increases ionic content of water. More flow of water in rainy season lower the conductivity due to dilution of pollutant and lower the ionic content of water .Pande and Sharma (1998) in river Ramganga.

4. D.O.

Dissolved Oxygen in water is of great importance in any aquatic ecosystem. D.O. level depends on mainly biological activity and decomposition of organic matter in water. In present study D.O. at site S1 ranged from 4.21-5.54 mg/L and 3.89 mg/L. to5.42 mg/L. at site S2.It is maximum in August at site S1 may be due to low atmospheric temperature and it is minimum in summer may be due to high metabolic rate of organism. Similar observations are also measured by Mishra & Yadav (1978).

5. Free CO_2

Carbon dioxide is the end product of organic carbon degradation in almost all aquatic environments and its variation is often a measure of net ecosystem metabolism (Wetzel,2006). Free CO_2 observed during study at site S1 was ranged from 3.65 to 5.08 mg/L and 3.55 to 5.18 mg/L at site S2. It is Maximum during summer in the month of April and May at site S2, it may be due to decreased productivity leading to decomposition which forms CO_2 in water. CO_2 level is minimum in the month of August in rainy season at site S2 due to dilution effect on organic matter and large quantity in flooded river.

6. Alkalinity

It is the measure of the ability to neutralise the acidity of water. In the present study the total alkalinity at site S1 was ranged from 210.12 mg/L. to 267.20 mg/L and 208.03mg/L. to 256.25mg/L. at site S2. Minimum value in the month of April and Maximum during the month of September, it may be due to increased domestic

activity which discharge in water.In present study variations are observed in different season which are not significant However alkalinity increases towards downstream. Similar finding were observed by Datar and Vashishtha (1992) in river Betwa

7. Total Hardness

The total hardness of river Penganga varies from season to season. Values observed at site S1 were ranged from 98.18 mg/L. to 133.31 mg/L and 102.15 mg/L. to130.10mg/L.at site S2. Maximum hardness was obtained during summer at site S1 and The relatively lower value in the month September at site S2. The values are within the permissible limits indicated by WHO (1991).

8. Total solids :

In present study Total Solids in Penganga river shows seasonal variation at site S1 was ranged from 365.00 mg/L. to 445.00 mg/L and 367.00 mg/L. to 419.00 mg/L at site S2. It is Maximum in rainy season due to surface run off soil and enormous transfer of solids along with rain water. It is Minimum in summer.In present study it was observed that level of Total Solids increases from upstream site S1 to downstream site S2.similar pattern was observed by Verma and Shukla (1976).

Conclusion :

The present research work shows that River Penganga showing various seasonal fluctuations which leads to the deterioration of river water,it may be due to all the waste discharge from the village, agricultural field, change the Physico-Chemical characteristics of the river water beside it adversely affect the Ecology of river.

Table 1. Monthly Variations in Physico-Chemical Parameters of River Penganga at **Site- S1.**

S.N	Parameters	April	May	June	July	Aug	Sept	Mean
1	Temperature	31.20	34.10	32.10	30.10	28.70	27.90	30.68
2	pH	7.48	7.87	8.20	8.03	8.15	8.25	7.99
3	Conductivity	0.321	0.343	0.327	0.309	0.284	0.268	0.308
4	D.O.	4.30	4.21	4.52	4.76	5.29	5.54	4.77
5	CO2	5.08	4.89	4.35	3.75	3.65	4.12	4.30
6	Alkalinity	210.12	251.10	233.70	248.67	260.12	267.20	245.15
7	Hardness	133.57	123.21	112.82	103.56	103.20	108.18	114.09
8	T.S.	365.00	383.00	405.00	445.00	429.00	340.00	394.50

Table 2. Monthly Variations in Physico-Chemical Parameters of River Penganga at **Site S2.**

S.N	Parameters	April	May	June	July	August	September	Mean
1.	Temperature	31.50	34.12	32.40	30.60	29.10	28.10	30.97
2.	pH	7.42	7.89	7.87	7.46	7.72	8.08	7.67
3.	Conductivity	0.324	0.346	0.340	0.306	0.296	0.273	0.314
4.	D.O.	4.35	3.89	4.32	4.27	5.14	5.42	4.56
5.	Free CO_2	5.18	4.74	4.38	4.25	3.55	4.03	4.35
6.	Alkalinity	208.03	248.57	256.25	252.65	247.80	254.00	244.55
7.	Hardness	129.00	130.10	122.00	126.10	119.95	102.15	121.55
8.	Total Solids	367.00	386.00	411.00	417.00	419.00	398.00	399.67

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