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STUDY OF PHOSPHATE PRESENT IN THE INDUSTRIAL WATER SAMPLE OF NIPANI TOWN

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ABSTRACT: The industrial water samples were collected from Halsiddhanath sugar factory, Nipani town and analysed every month throughout the year. So, we have studied levels of phosphate in industrial water from industries and sewage disposal sites. Phosphate content was 2.3 mg/L.

KEYWORDS: Industrial water sample, Pollutants, Phosphate.

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1.INTRODUCTION

Due to continuous demand for water is growing rapidly as population and industrial activities are expanding and irrigated agriculture continues to increase. Rapid industrialization industrial effluent are discharged in water these are dangerous to human health as well as biotic habitats. In the present study, the level of phosphate was studied in the vicinity of sugar factory located at Nipani. The underground water samples were collected from industrial water sample in the glass bottles by following standard procedure1. Samples were taken from Halsiddhanath sugar factory which are located near 1. Bhim Nagar 2. Savant Colony 3. Ayodhya Nagar 4. Bhopale Galli 5. Ambalzari Nala 6. Azad Galli 7. Burud Galli 8. Pratibha Nagar 9. Ashray Nagar 10. Pragati Nagar 11. Shivaji Nagar 12. Mestri Nagar. The samples were collected every month throughout the every year and analysed in labouratory for the levels of phosphates2,3.

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2.MATERIALS AND METHODS

EXPERIMENTAL

Methodology for determination of phosphate

There are several methods available for the determination of orthophosphate viz. vanado – molybdate method, molybdenum blue method and ascorbic acid method4,5. Out of these, vandomolybdate method was choosen in the present work for the estimation phosphate in water samples.This method is considered to be slightly less sensitive than the molybdenum blue method but it has been particularly useful for phosphrous determination carried out by means of schoiger Oxygen flask method6,7. The phosphor -vanado-molybdate complex formed between the phosphate, ammonium vanadate and ammonium molybdate is bright yellow in colour and is its absorbance is measured at 465 nm.

Reagents

a) Ammonium vanadate solution. b) Ammonium molybdate solution. c) Standard phosphate solution. Procedure A 10 mL aliquot (i.e. 4 mg. Phosphate) of this solution was placed in a 100 mL graduate flask in the presence of 50 mL water and 10 mL of ammonium molybdate solution and diluted to mark. Like this, a series of standards were prepared from potassium dihydrogen phosphate standard solutions covering the range 0-20 mg phosphrous per 100 mL and containing the same concentration of acid, ammonium molybdate and ammonium vanadate as earlier absorbance of this solution was determined at 465 nm using 1 cm cell, against a blank prepared in the same manner8,9.

3.RESULTS AND DISCUSSION

Phosphates occur in natural wastes and waste water as Orthophosphates, condensed phosphate and organically bound phosphates, in solution, particulate matter and in the bodies of aquatic of micro-organism. Orthophosphates are applied to agricultural or residential cultivated land as fertilizers and transported in to surface water during stormy runoff. Organic phosphate is formed. Primarily by biological processes from orthophosphates. They are contributed to sewage by loody wastes and food residues.The quantities of phosphates varied throughout the investigation at all stations of surface waters. This might due to constant contamination of domestic sewage, cloth washing, bathing, decay of aquatic organisms and and mankind activities similar collaboration between amount of phosphate and human activities was observed by Hachinson. (1957)

From Table, concentration of phosphate in industrial effluent and leaching from the agricultural land is also strong possibility. ranged from 1.56 mg/L. In Jaunary to 3.77 mg/L in December). Winter season showed higher phosphate concentration in industrial effluent are 3.03 mg/L followed in summer 1.39 mg/L and a reduced in rainy season i.e.0.37 mg/L, (Tables 1 and 2).

Table 1: Total Phosphate (mg/lit) in Industrial water sample

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2.28	5.98	2.21	1.92	1.71	0.01	0.96	0.54	0.55	0.56	3.76	3.02
2	2.14	4.01	1.32	1.25	1.06	0.04	0.47	0.08	0.09	0.10	5.40	3.77
3	2.53	5.20	1.64	1.46	1.22	0.01	0.43	0.24	0.25	0.26	3.82	3.18
4	3.25	5.54	2.17	1.60	2.11	0.00	0.47	0.19	0.20	0.21	3.69	3.47
5	2.81	4.80	2.03	1.84	2.14	0.32	0.36	0.13	0.14	0.15	3.14	2.98
6	2.16	4.31	1.46	1.32	1.17	0.21	0.60	0.78	0.79	0.80	0.97	1.57
7	1.74	4.02	1.42	1.63	1.25	0.00	0.06	0.82	0.83	0.84	3.91	2.83
8	1.56	4.03	0.97	1.22	1.17	0.00	0.00	0.08	0.09	0.10	3.89	2.73
9	1.57	4.62	1.20	1.32	12.24	0.70	0.06	0.03	0.04	0.05	3.45	2.51
10	1.59	4.70	1.15	1.31	1.25	0.00	0.36	0.29	0.30	0.31	1.14	1.37
11	2.45	3.46	2.70	1.25	1.57	0.01	0.57	0.19	0.20	0.21	1.31	1.35
12	2.34	4.42	1.50	1.36	1.39	0.00	0.36	0.19	0.20	0.21	1.50	1.62

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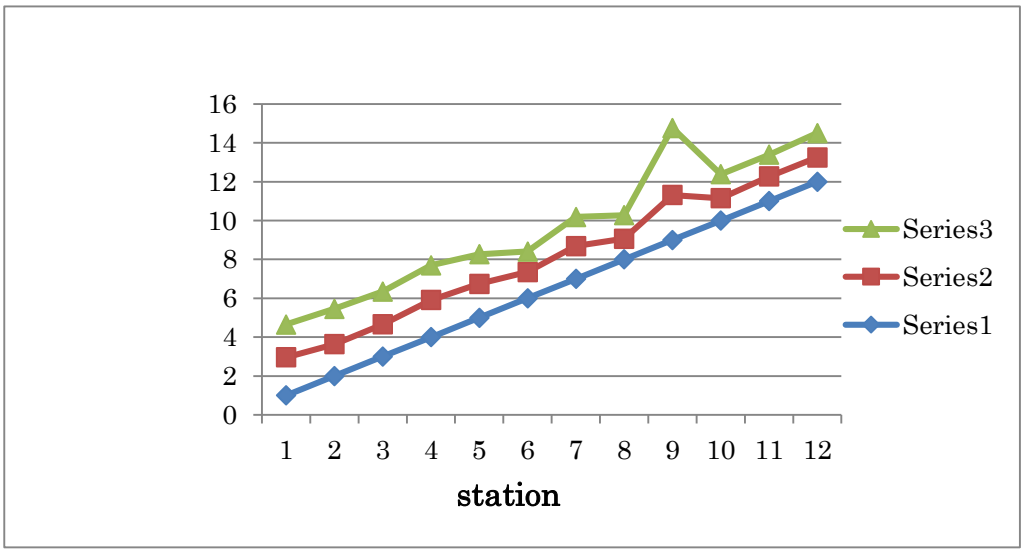
2016 Sept- Oct RJLBPCS 2(3) Page No.174

Fig. 1: Total Phosphate (mg/lit) in Industrial water sample

Stations	Average	S.D
1	1.96	1.69
2	1.64	1.82
3	1.66	1.69
4	1.91	1.79
5	1.74	1.53
6	1.35	1.06
7	1.69	1.50
8	1.07	1.21
9	2.32	3.45
10	1.15	1.24
11	1.27	1.12
12	1.25	1.26



Average seasonal level of phosphate (mg/L) in industrial water samples at various sampling stations

Stations

Stations	summer	Rainy	Winter
1	1.46	0.76	3.70
2	0.92	0.30	3.85
3	1.08	0.19	3.60
4	1.47	0.35	3.90
5	1.58	0.26	3.43
6	1.04	0.67	2.25
7	1.07	0.44	3.35
8	0.84	0.04	2.40
9	3.86	0.05	3.04
10	0.93	0.34	2.25
11	1.38	0.38	2.16
12	1.06	0.25	2.48

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2016 Sept- Oct RJLBPCS 2(3) Page No.176

4.CONCLUSION

The present study has shown higher phosphate level regardless of seasonal fluctuations, indicating sucession of surface water i.e. pond water from Oligotrophic to eutrophic state Water at sampling site 4,5,6,7 showed higher average value of phosphate to city sewage and domestic waste mixing in to the surface waters. A contribution, most likely due to industrial effluents and leaching from the agricultural land, is also a strong possibility. A similar profile emerged regardless of seasons. According to Edmondson, therefore, sewage effluents have been regarded on good source of phosphates

CONFLICT OF INTEREST

The authors declare that no competing financial interests exist.

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