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Short Communication

WATER QUALITY AND WATER BORNE DISEASES IN URBAN AREA OF PATNA (BIHAR) INDIA

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ABSTRACT

Water samples were collected for qualitative and quantitative analysis from different sites of Patna City. For assessment of water quality, a laboratory test was conducted. Conducvity increases with increase of hardness. The present study indicated that the water is also contaminated with coliform bacteria.

KEY WORDS: Water samples, Coliform bacteria, Cardiovascular diseases, Hardness, variation.

INTRODUCON

Water is being put to various uses by man like cooking, bathing, drinking, disposal of sewage and disposal of industrial waste. During all these processes the undesirable substances are added to the water sources to such an extent that different water bodies and underground water contain polluted water. Water becomes a killer when it becomes carrier of water borne diseases. About 80% of all diseases are water borne, some of them are communicable. WHO report has pointed out that four out of five children suffer from water borne diseases. All over the world bacteriological diseases alone account for 25,000 death per day. Drinking water is drawn from sub surface of water by means of wells, Hand pump and tube well in Patna.

Study area

The imperial city of Patna sprawling on the southern banks of the sacred river ganga is among the world's oldest capital cities, with a continuous history of over two millennia.

The area selected for study is situated in Patna town of state Bihar. Majority of people use water supplied by Patna Jal Parisad. The municipal water distribution network provides water for domestic uses for majority of residents. However, many peoples observations all over the town have to supplement the municipal supply through their own resources.

MATERIAL AND METHODS

Water samples were collected in clean plastic botle from different sampling sites of Patna City. Samples were immediately taken to laboratory for Physico-chemical and bacteriological analysis. Analysis of water samples was done following the standard methods APHA (1992) and Trivedy and Goel (1986).

RESULTS AND DISCUSSION

The results obtained from Physico-chemical and bacteriological analysis of water samples collected from different locations are compared with drinking water standard (WHO/ICMR). The conductivity of water was recorded during the period of investigation which varied from 0.369 ml mhos/ cm to 0.964 ml mhos/ cm (Table 2). Wide range of variation were found during the period of investigation. Kundu *et al* (2023) found similar trend of observations.

The pH of water samples was found to vary from 7.17 to 7.71. pH of water was found within safe limits prescribed by WHO. Gawas *et al.* (2006) also reported a similar trend of observation.

TDS of water varied from 292-761 mg/l during the period of investigation (Tables 2) Samson *et al.* (2011) also found similar trend of observations. Hardness of Water varied from 150-330 mg/l. Numbers of coliform bacteria were counted from

Table 1. Physico-chemical and Bacteriological Parameter of Water samples of Patna City (2022)

Sample No.	Type	Conducvity (µS/100 cm)	pH	TDS (mg/l)	Hardness (mg/l)	Coliform Count (MPN/100 ml)
1.	Tube well	0.396	7.31	323	220	666
2.	Tube well	0.409	7.36	335	250	1000
3.	Tube well	0.369	7.61	300	150	3000
4.	Tube well	0.395	7.47	322	160	1000
5.	Tube well	0.836	7.55	320	691	2000
6.	Hand Pump	0.671	7.28	461	240	00
7.	Tube well	0.478	7.71	376	300	1000
8.	Hand Pump	0.464	7.61	336	280	00
9.	Tube well	0.864	7.35	637	330	3000
10.	Tube well	0.575	7.51	415	300	00
11.	Tube well	0.603	7.54	460	320	00
12.	Tube well	0.490	7.45	375	230	00
13.	Tube well	0.964	7.17	761	330	4000
14.	Tube well	0.699	7.25	512	260	00
15.	Tube well	0.385	7.71	292	210	1000
16.	Tube well	0.475	7.25	377	300	00
17.	Tube well	0.940	7.28	421	250	00
18.	Tube well	0.725	7.30	556	280	2000
19.	Tube well	0.595	7.18	466	310	3000
20.	Tube well	0.585	7.17	424	304	00

Table 2. Characteristic of Potable water and its statistical analysis based on Table 1

Parameter .	Minimum	Maximum	Range	Mean
Conducvity (µS/cm)	0.369	0.964	0.595	0.595
pH (mg/l)	7.17	7.71	0.54	7.40
TDS (mg/l)	292	761	469	442
Hardness (mg/l)	150	330	180	267.2
Coliform Bacteria MPN/100 ml	00	4000	4000	1083

different region of Patna City. The coliform count varied from 0 to 4000/l from different locaon as presented in Table 1.

It reveals that the bacterial contaminaon in tap water is mainly due to damaged pipelines crossing at different places with sewage drainage system.

CONCLUSION

The result obtained from different sampling locations of Patna City indicate that the water is moderately hard in most part of the study area whereas some water samples are hard. Hard water is responsible for cardiovascular diseases. However, in case of higher values of coliform bacteria indicates faecal contaminations. Municipal water supplies were found to be contaminated with coliform group of Bacteria. These water causes various diseases like diarrhoea, jaundice, typhoid, dysentery etc.

So municipal water was not fit directly for human consumption unless it was sufficiently treated and disinfected.

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