



ORIGINAL RESEARCH PAPER

Zoology

BACTERIAL CONTAMINATION IN MUNICIPAL WATER OF PATNA, BIHAR

KEY WORD: Bacteria, Contamination, Coliform Count, Human Health.

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ABSTRACT Number of coliform bacteria were very high in municipal water in Patna, number of coliform varied in different locations of Patna Municipal Area. Maximum number of coliform bacteria were 6000 per litre in tap water. These water causes water borne diseases like dysentery diarrhoea etc. Municipal water was fit for human consumption. The overall picture that emerges out of the present study warns strict check to maintain the quality of drinking water. Improved method for handling and disposal of sewage, garbage and night soil should be introduced. To control epidemics and other diseases proper method of sterilization of water should be developed.

INTRODUCTION

Natural waters are rich in bacteria, algae, protozoa, worms and other organisms. The greater the amount of nutrients in water, the faster the biological contaminants develop. The most frequently Occurring microorganisms are bacteria which take an active part in the formation all aquatic populations. They inhabit sludge and other bottom grounds in large quantities and grow into intricate shapes under water objects. The minutest microorganisms, they are smallest constituents of plankton. Bacteria from stable suspensions since their density is close to that of water because their cells contain about 85% of water. The greatest populations of microorganisms are found in water from May to July although the nutrient in water is not the maximum during that period. It is probably explained by the temperature changes in water. The number of bacteria in water sharply increase after rainfall and decreases in bright weather. According to international experts on potable water most water before they reach the consumer have been exposed to some amount contamination. These include water bacteria or microscopic organisms. The kind of impurity depends entirely on the water supply and sewage disposal system as a whole. Hence it was decided to assess the degree of pollution on the basis of bacterial studies in municipal water of Patna.

METHODOLOGY

Water samples were collected from different regions of Patna. Bacteriological analysis of water was done following the standard methods (APHA 1992) and Trivedy and Goel (1986).

Sampling: A sample should be representative of the bacteriological quantity; hence extreme care should be taken to avoid contamination. Pre-sterilized bottles were used for sampling. Samples were collected and the bottles were immediately closed to avoid contamination by hand. Samples after collection should be immediately taken to the laboratory.

The coliform counts were determined by surface count method/MPN method. One hundred samples were collected for analysis from five locations.

RESULTS

Microbiological observations were made during the period of investigation. Number of coliform bacteria were counted from different regions of Patna. The coliform number were varied in different locations (Table-1). The range of coliform number is 3000/L to 6000/L in five different locations. Minimum value of coefficient of variation is 52.3% at location A and maximum value of coefficient of variation is 345.37 at location E. It reveals that the contamination in tap water is mainly due to old, poor with open sewage drainage system in the locality.

DISCUSSION

The coliform group of bacteria is the principal indicator of suitability of water for domestic use. The density of coliform group is the criteria for the degree of contamination and has

been the basis for bacteriological water quality standard. The drinking water standard recommended by ICMR for coliform group is 1per 100 ml. Mueller (1979), Kumar et al (2005), Joshi et al (2006), Vayas (2011) have reported the bacterial contamination in different water bodies. Hazim et al (2020), Yohanes Agus Setianto et al (2021) have also reported high bacterial count during the period of investigation.

CONCLUSION

The present study revealed that the most municipal water supplies are affected by various human activities. Values of most parameters were more than the permissible limits of ICMR or WHO(1/100ml) for coliform count. Municipal water supplies were found to be contaminated with coliform group of bacteria. These water causes various diseases like typhoid, dysentery, jaundice, diarrhoea, etc. So municipal water was not fit directly for human consumption unless it was sufficiently treated and disinfected. Therefore, it is advisable to chlorinate the water before drinking and other purposes.

TABLE-1 Characteristics of potable water and its statistical analysis of coliform bacteria.

Location	Min	Max	Range	Mean	S.D	S.E	CV (%)
A	00	4000	4000	2283.3	1195.92	267.54	52.37
B	00	6000	6000	1775	1499.78	335.52	84.49
C	00	4000	4000	799.9	1181.74	264.37	147.73
D	00	3000	3000	13775	1134.10	253.71	82.48
E	00	3000	3000	483.3	1669.18	373.41	345.37

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