ORIGINAL RESEARCH PAPER

Zoology

BACTERIAL CONTAMINATION IN RURAL WATER OF PATNA (BIHAR)

S.K. Sinha | Department Of Zoology, L.P. Shahi College Patna, Bihar, India.

ABSTRACT

The density of coliform group is criteria for the degree of contamination and has been the basis for the bacteriological water quality standards. Number of coliform bacteria varied from different locations of rural area of Patna. Coliform count is very high in well water where as coliform count is nil in hand pump water. Maximum number of coliform bacteria were 666/L in well water. These water causes various diseases like diarrhoea, jaundice, typhoid, dysentery etc.

INTRODUCTION

In the last few decades there has been tremendous increase in the demand for the fresh water due to rapid growth of population. The quality of water is of vital concern for mankind since it is directly linked with human welfare and sustainable development. Drinking water is drawn from subsurface of water by means of wells, hand pumps or tube wells We pollute these sources of supply with our own excreta. Water polluted in this way can spread such epidemic diseases as typhoid, dysentery, jaundice etc. Bacterial contamination is a threat for the spread of water borne diseases. About 80% of all diseases are water borne some of them is communicable like cholera, typhoid, dysentery etc. W.H.O report has pointed out that four out of five children suffer from water borne diseases.

MATERIAL AND METHODS

Study Area: The area selected for study is village Nisarpura (A) which is situated in Patna district of state Bihar. The village is located at the distance of 50 km far from Patna which is present between river Son and Son canal. The second selected area for study is village Mohamadpur which is also situated in Patna district of state Bihar. The village is located at the distance of 40 km far from Patna near Son canal.

SAMPLING

The frequency of sampling in bacteriological examination is very important, which is also depends on the type of analysis. A sample should be representative of the bacteriological quantity, hence extreme care should be taken to avoid contamination. Pre-sterilised and paper wrapped BOD bottles may be used for sampling. While sampling in natural water, the bottle is lowered in water. The bottle should be held there by base in one hand while with the other hand the stopper and cover are removed together. There should be retained and the filled bottle is hold up. Do not fill bottle completely, allow air space of about 3 cm while sampling for the taps the external fitting on the tap are removed and the tap is sterilised by an ignited piece of cotton, soaked in methylated spirit until it is opened near the tap. Water is collected and the bottle is immediately closed to avoid contamination by hand. Samples after collection should be immediately taken to the laboratory for examination. If the immediate analysis is not possible, the samples can be preserved at 4 up to 6 hours but in no case more than 24 hours. The coliform counts were determined by surface count method/ MPN method. Sixty samples were collected for analysis from villages. Bacteriological analysis of water was done following the standard method (APHA 1992) and Trivedy and Goel (1986) and recorded during the period of investigation.

RESULTS

Bacteriological observations were made during the period of investigation. Number of coliform bacteria were counted from both the villages. The coliform number were varied from 0/L to 666/L during the period of investigation in village Nisarpura. Number of coliform bacteria were also counted from different region of village Mohamadpur (Patna). The coliform number were varied from 0/L to 350/L during the

period of investigation. The maximum number of coliform bacteria were found in well water for both the villages (Table-1). The value of range, mean, standard deviation, standard error and coefficient of variation for all the observed parameters of both the villages showed in Table-1.

DISCUSSION

The coliform group of bacteria is the principal indicator of suitability of water for domestic use. The drinking water standard recommended by ICMR for coliform group is 1 /100 ml. The range of location-A 666/L and location B is 350/L. So, water samples of both sites are contaminated with coliform bacteria. Coefficient of variation varied in both sites. Dutka et al (1980), Kumar et al (2005), Joshi et al (2006) also found high bacterial count during the period of investigation. Dutka et al (1980) found E. coli, Streptococcus faecalis and Salmonella Thompson in stream. Kumar et al (2005) also found high coliform bacteria during the period of investigation. Kiran and Jha (2011), Vayas (2011) and Hazim et al (2020) also found high bacterial count.

Table -1 Characteristics of potable water and its statistical analysis coliform count/L.

Parameter	Location A	Location B
Min	00	00
Max	666	350
Range	666	350
Mean	27.76	5.83
S.D.	124.68	45.18
S.E.	16.09	5.83
C V %	449.13	774.95

Note: SD (Standard deviation), SE (Standard error), CV (Coefficient of variation).

CONCLUSION

The microbiological parameter results obtained in the present study higher values of coliform count indicates faecal contamination. These water causes various water borne diseases like diarrhoea, typhoid, jaundice etc. Therefore, it is essential to chlorinate the water before drinking and bathing.

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