Short Communication

Bacteriological examination of drinking water with reference to coliforms in Jeedimetla, Hyderabad, India

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Most probable number (MPN) test was done to detect the coliform in water samples collected from mobile vendors, protected well and municipal tap water supplied from Jeedimetla municipality. The study revealed that the number of coliforms was very high (≥ 1500) in water samples collected from mobile vendors. The bacteria were identified as *Escherichia coli*, *Pseudomonas aeruginosa* and *Staphylococcus aureus*. Bacteriological examination of water samples collected from different sources showed that the water of mobile vendors and ground water of jeedimetla area was not potable while the municipal tap water was found to be safe for drinking.

Key word: Water samples, MPN method, coliforms, bacteria.

INTRODUCTION

The World Health Organization estimated that up to 80% of all sicknesses and diseases in the world are caused by inadequate sanitation, polluted water or unavailability of water (WHO, Basic Environmental Health, Geneva, 1997; Daunders and Warford, 1976). A review of 28 studies carried out by the World Bank gives the evidence that incidence of certain water borne, water washed, water based and water sanitation associated diseases are related to the quality and quantity of water and sanitation available to users (Abebe, 1986; Kalbermatten, 1990). According to rough estimates, more than 15 million deaths worldwide result annually from waterborne infections (Atlas and Bertha, 1997). During the first two decades, the quality of drinking water has undergone radical changes (Katayal et al., 1991; Kudesia, 1990). The surface water sources, in general, are not acceptable for drinking purpose as these are often loaded by various organic, inorganic and biological constituents (Dahiya and Kaur, 1999; Kumar et al., 1996). The safety of drinking water can be monitored in a number of ways because the constituents of drinking water (such as chemicals and microbes) which can compromise human health can be measured directly. The reason for monitoring drinking water quality is to determine whether the water supply system is being operated correctly, implying that the water is safe for drinking or not. Indicator micro-organisms survive better and longer than the pathogens with a uniform and stable properties and may easily be detected by standard laboratory techniques.

The present study was designed to detect the coliform and to assess the quality of drinking water and also the quality of water supplied by mobile vendors, protected wells and municipality water.

MATERIALS AND METHODS

The method of sample collection at each source was according WHO guidelines for drinking water quality assessment (WHO, Guidelines for Drinking water quality, 1983). 500 ml of water samples from mobile vendors, protected wells and municipal tap water collected, labeled and kept in icebox during transportation and analyzed in the laboratory. The examination of coliform organisms and microbiological studies were followed as per the methods given by APHA (1998), WHO (1996), Fresenives et al. (1988), Bonde (1977) and Patralekh (1991).

RESULTS AND DISCUSSION

Most probable number (MPN) of coliform in case of water sample collected from mobile vendors was estimated to be very high (≥ 1500) and in case of water of protected well, it was 800 and not potable (Table 1). No coliform was detected from municipal tap water, supplied for drinking to the inhabitants of jeedimetla area of Hydera-

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Table 1. Character of bacteria and indication of portability for each water sample.

Water source	Reaction/morphology	MPN	Potable	Non-potable
Mobile vendor	Gram-negative, rod-shaped bacilli	≥ 1500	No	Yes
Protected well	Gram-negative, rod-shaped bacilli	800	No	Yes
Municipal tap	–	< 4	Yes	No

MPN: Most Probable Number

Table 2. Biochemical characterization.

Organism	LB	DB	VP	MR	Citrate	Urease
E. Coli	+	+	–	+	–	–
P. aeruginosa	–	–	–	–	+	–
S. aureus	–	–	±	+	–	–

LB: Lactose broth; DB: Dextrose broth; VP: Voges-Proskauer; MR: Methyl Red.

bad (Table 1). Biochemical properties of bacteria clearly revealed the presence of *E. Coli, Pseudomonas aeruginosa* and *Staphylococcus aureus* in the water samples collected from mobile vendors and protected wells (Table 2).

According to Central Pollution Control Board, India, total coliforms organism MPN/100 ml shall be 50 or less in drinking water source.

The consumption of drinking water contaminated with pathogenic microbes of faecal origin is a significant risk to human health in the developing world, especially in remote rural areas and industrial areas (Davies-Colley et al., 2001). Over 3 million deaths per year is attributed to water-borne diarrhoeal diseases, especially among infants and young children in poor communities in Africa, Asia and South America (Anon, 1997). I would like to recommend the proper sanitary survey, design and implementation of water and or/ sanitation projects; regular disinfections, maintenances and supervisions of water sources, and regular bacteriological assessment of all water sources for drinking should be planned and conducted.

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