Bacteriological Study of Drinking Water in South Indore City (M. P.)

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Abstract: *A bacterial activity in ground water depends on nature of water along with its substances and environment. It may be a carrier of a variety of water borne diseases, such as diarrhea, cholera, jaundice, typhoid and dysentery. The importance of clean water for health has long been recognized, yet it is still a problem around the world. Human faecal contamination is one of the major reasons for water diseases. In the present study only 11.88%, 23.33%, 15% of drinking water samples were bacteriological unfit for drinking purpose, in rainy, winter and summer seasons respectively. Developing countries may find this test more appealing than the membrane filtration test or multiple tube fermentation tests recommended in Standard Methods for Water and Wastewater Treatment. (Pillai1999).*

Keywords: Drinking water, Bacteriological Study, health status and water borne Diseases.

1. Introduction

Pollutants released to surface change the quality of ground water. Polluted surface water bodies that contribute to ground water recharge become source of its pollution However. Leakage of sewage into ground water is a common occurrence especially from old sewers, leakage result from poor workmanship, defective sewer pipes, and sewer leakages introduce high concentration of Nitrate, organic chemicals and Micro organisms.

Water is one of the most essential needs for the continued existence of all living organisms on earth. The day-to-day activities of all living organisms require water in some form. Around 2.2 million die of basic hygiene related diseases, like diarrhoea, every year. The great majority are children in developing countries. Interventions in hygiene, sanitation and water supply make proven contributors to controlling this disease burden. The provision of drinking water of acceptable microbiological quality and low infectious disease risk requires a number of essential elements within a Water Safety Plan. Within any water safety plan emphasis is placed on controlling and detecting faecal contamination of drinking water and its sources. Traditionally, this measure of faecal contamination has been a bacterium or group of bacteria considered indicative of faecal contamination. The measurement of such indicator bacteria of faecal contamination requires trained analysts, media and other supporting materials and facilities available only in a microbiology laboratory or the use of a water microbiology field analysis kit.

2. Material and Methods

The Drinking water samples collected from the different sources like Tap water and Tube well. A total of 60 drinking water samples were collected for bacteriological analysis from south Indore city were collected from the city during 2010-2011. The microbiological quality of drinking water samples was tested by the field test method designed by Manja et al. (1982). This method is based on the detection of hydrogen sulphide producing organism in water by the use of hydrogen sulphide strips.

3. Result and Discussions

The samples have been collected different drinking water sources namely Tap water and Tube well in south Indore city (Fig. 1, 2 and 3). The study has been done seasonally. In the present study only 11.88%, 23.33%, 15% of drinking water samples were bacteriological unfit for drinking purpose, in rainy, winter and summer seasons respectively. In south Indore city Tap water (56.66%) is the major source for drinking purpose followed by Tube well (43.33%).

During rainy season 6.66% of tap water samples were bacteriological unfit for drinking purpose and 6.97% of tube well samples were bacteriological unfit for drinking purpose respectively. During winter season 26.78 % of tap water samples were bacteriological unfit for drinking purpose and 18.60% of tube well sample were bacteriological unfit for drinking purpose respectively. In the present study, during summer season 19.64% of tap water samples were bacteriological unfit for drinking purpose and 30.03% of tube well sample were bacteriological unfit for drinking purpose respectively.

In the study areas the Tap water as a drinking water source which was found to be 26.78% contaminated in winter season and tube well was found to be 30.03% contaminated in summer season. Water source is mostly contaminated due to either its location near the sewage line or waste water which stand around the source. Seepage from sewage line also contributes to bacterial contamination. At many places the pipeline of municipal tap water supply crossed the sewage water which causes water borne diseases, such as diarrhoea, cholera, jaundice, typhoid and dysentery. Prajapati and Bhagore (2012) reported that 15%, 15% and 35% of drinking water samples, bacteriological unfit for drinking purpose.

Kaushik et al., (1963) reported than 93% of drinking water in Delhi was unfit for drinking purpose. Narayan and Rao (1981) also reported 100% well water to be bacteriological unfit for human consumption in Warangal town. Pathak and Gopal (2005) evaluated the efficacy of H_2S test with 90 water samples at different incubation period and temperature and found that H2S positive result was

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exhibited by 78% of samples. Castillo (1994) concluded that the simplicity and low cost of the H₂S test makes it very applicable to tropical and subtropical potable water test. Ratto (1989) evaluated the H$_2$S test at 22 and 35°C and compared it to MPN and fecal coliform tests for 20 potable water samples and concluded that H$_2$S test was a more sensitive test than total coliform (TC) and fecal coliform (FC) tests.

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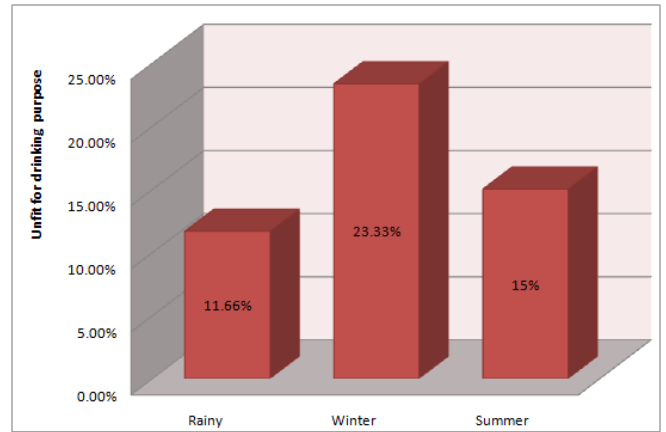
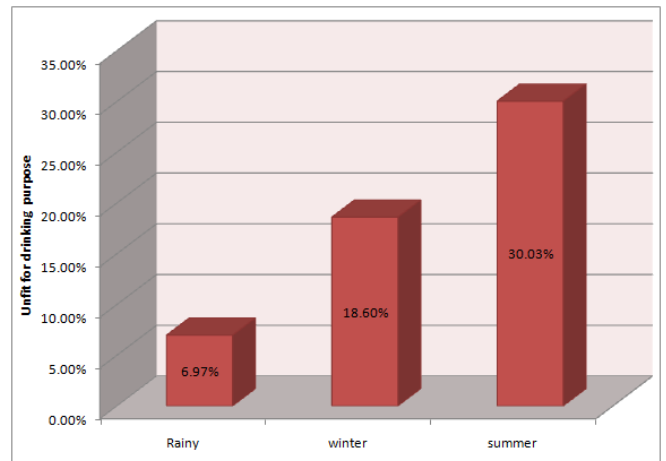**Figure 2:** Bacterial Quality of Drinking water of south indore city
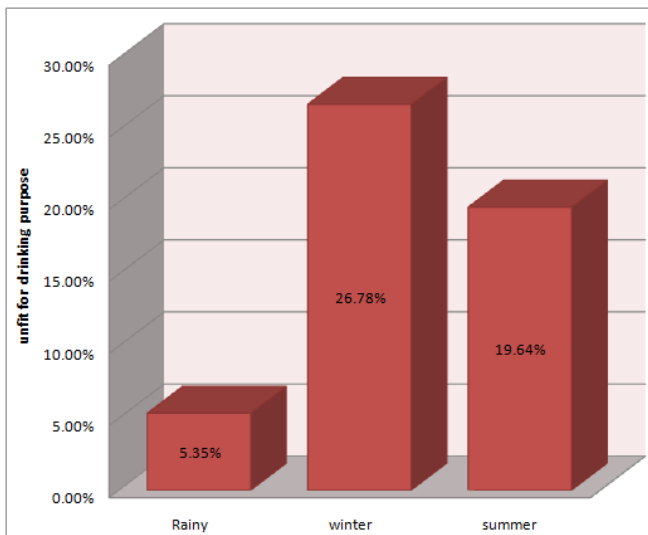

Figure 3: Bacterial Quality of tube well

Figure 1: Bacterial Quality of Tap water