



STUDIES ON ASSESSMENT OF POTABILITY OF DRINKING WATER AVAILABLE IN HOTELS OF AMRAVATI DISTRICT OF MAHARASHTRA STATE (INDIA)

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ABSTRACT

The study was carried out to determine the potability of drinking water of different hotels of Amravati district. The study shows that poor hygienic conditions, improper handling, improper method of storage and serving practices of drinking water in hotels of Amravati district leads to severe water born diseases. Microbial tests i.e., coliform count were determined using standard procedure. 60 samples were collected, out of 60, 66.66% were found non potable by MPN method. From the study, it was concluded that quality of water can be improved by imparting water hygiene behavior, education to hotel owners.

Key words: Potability, MPN count, Drinking water, Contamination of water, Bacteriological parameters, Hygienic conditions.

INTRODUCTION

Wikipedia define potable water as the water of high quality that could be consumed without risk of acute or chronic harm or injury. The importance of water to man cannot be overemphasized due to its essentially in body metabolisms and proper functioning of cells¹. Water is also useful resource for domestic, industrial and agricultural purposes. Though water is abundant in nature occupying 71% of the earth surface², only 1% is accenable for human consumption³. There is an interesting awareness around the world that water is becoming the critical issue of the 21st century⁴. According to WHO about 600 million episode of diarrhea and 40,000,00 childhood death reported per year because of contaminated water and lack of sanitation.⁵ Over a billion of people in India lack safe water, 80% of infectious diseases are water born, killing millions of children in each year⁶.

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During storage and handling in hotels and restaurants, people contaminate water with pathogenic microorganism. Tambekar et al.⁷ stated that water gets contaminated by incorrect method of collection, storage and handling practices in hotels and restaurants. The improving water handling practices by promoting water hygiene behavior improved water quality⁸.

The aim of present study was to access the capacity of hotel, to provide better potable drinking water. The objective is reached by means of assessing water supplied in the hotels. The assessment is done by bacteriological evolution of the drinking water and general survey of different canteens, hotels and road side Taprees (stalls) of Amravati district.

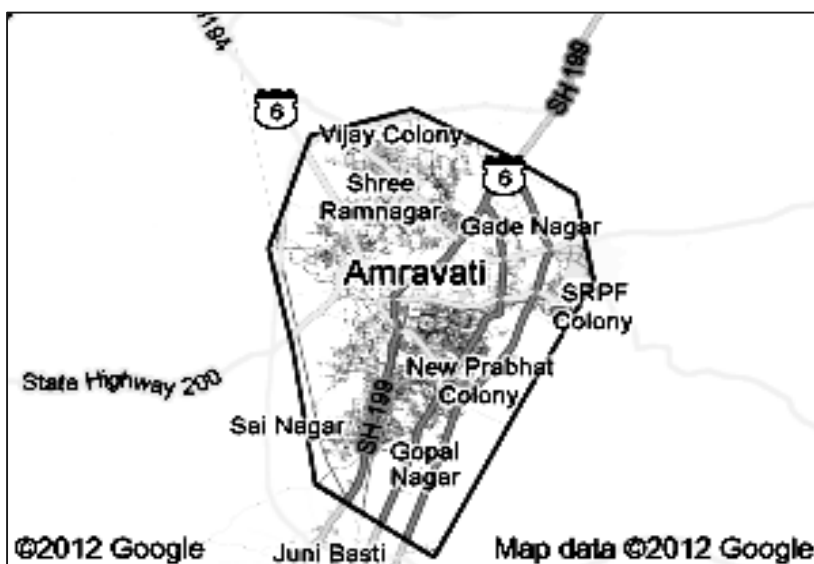


Fig. 1: Amravati district of Maharashtra (India)

Amravati city is located in the East Maharashtra (India) on the altitude of $20^{\circ}56'$ north and $77^{\circ}47'$ east. It is the main centre of west Vidharbha. It is surrounded by the district of Betul, Nagpur, Wardha, Yavatmal, Washim, Akola and Buldhana.

EXPERIMENTAL

In proper Amravati district, different types of hotels, road side taprees (stalls) and canteens are present. Drinking water is collected from different areas randomly. The potability of these samples were assessed by bacteriological tests. Total 60 samples were collected from following areas;

Table 1.

S. No.	Name of area	No. of samples from each area
1	Kathora naka	04
2	Praveen nagar	09
3	Shegaon naka	07
4	Gadge nagar	04
5	Panchwati	04
6	Irwin square	06
7	Canteens: 1) Govt. Vidarbha Institute of Sci., Amravati 2) Sri Shivaji College, Amravati	02
8	Rajkamal chawk	10
9	Itwara bazaar	07
10	Badnera	05
11	Congress nagar	02
Total		60

The information regarding hotels, road side taprees, canteens, were recorded on the basis of hygiene condition, method of storage of the drinking water etc. The information were recorded as follow as.

Table 2.

S. No.	Variable table	Value table
1	Class of hotels	Good Medium Low
2	Age of hotel owner	15-25 25-35 36-45 45-above

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S. No.	Variable table	Value table
3	Education of hotel owner	Secondary Higher secondary Graduate Post graduate Illiterate
4	Method of storage of drinking water	Plastic drum (pvc) Rajan Cement tank
5	Method of handling	By jag By tap By mug

60 samples were collected in sterile bottles from 11 different hotels and canteens, road side taprees (stalls) from Amravati district. Date, time, source was noted punctually and then samples were transported to laboratory. Bacteriological examination was performed within 5 hrs. of collection using multiple tube fermentation technique (MTFT) for determination of Most probable number (MPN), nine multiple tube dilution technique using double and single strength MacConkey broth, which detect *E. coli* with the production of pale yellow color. The MPN index was calculated from MPN table and index of water more than 10 coliforms/dl is designated as polluted or unhealthy for drinking purpose or non-potable⁹.

RESULTS AND DISCUSSION

On the basis of bacteriological test

Membrane filtration technique was used to isolate the microorganisms present in the water sample¹⁰. The results are stated according to McCraday's potability which shows the most probable number (MPN) of coliform bacilli in 100 mL of water.

Reporting interpretation (Presumptive coliform count)

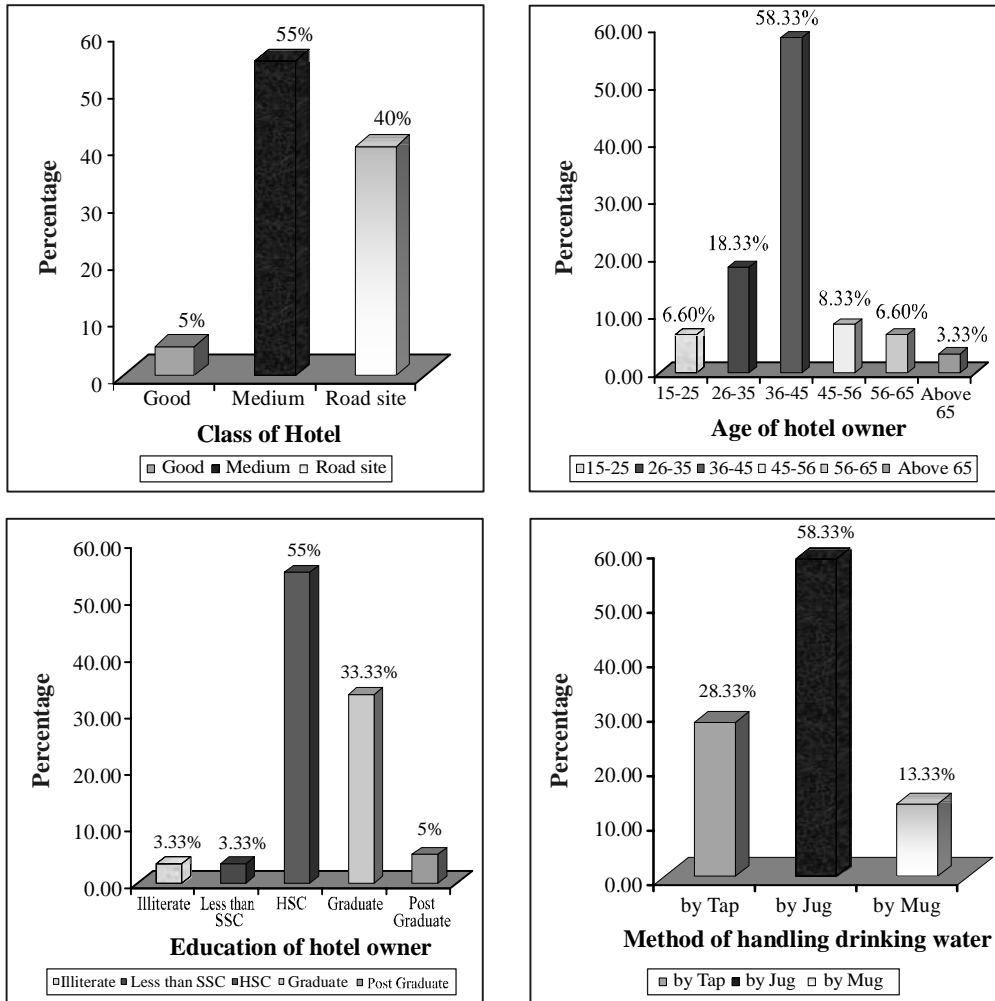
Table 3.

Class	Category	Coliform count/100 mL	percentage
I	Excellent	0	6.67
II	Satisfactory	1 to 3	21.66
III	Suspicious	4 to 6	5.00
IV	Unsatisfied	7 to 10	66.66

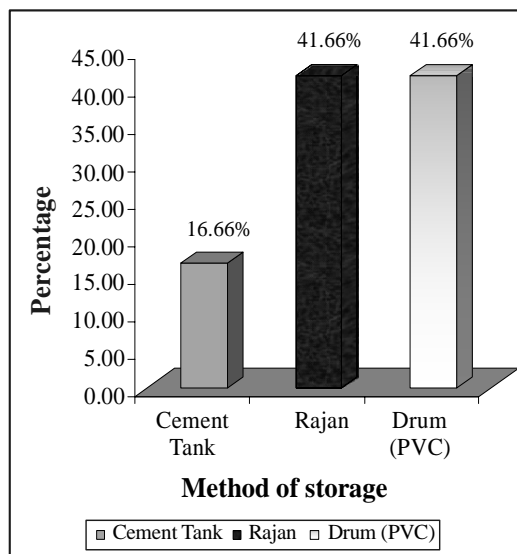
A total of 60 samples of drinking water were analyzed from 11 different places areas of Amravati district (Maharashtra) for potability of drinking water by standard method of water testing. Bacteriological test shows that out of 60 samples of water; 6.67% shows excellent result, means they can be used for drinking purpose; 21.66 % result are suspicious, 66.66% results shows MPN greater than 7, means this water cannot be used for drinking purposes.

On the basis of survey

Following graph shows information regarding class of hotels, age of hotel owner, their education, method of storage of drinking water and method of handling.



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**Fig. 2**

Results shows that medium class hotels are more i.e., 55% as compared to good class hotels and road site taprees 58.33 % of hotel owner having age in between 36-45 years. Generally the hotel owners are found not so much qualified.

There are different methods available for storage of drinking water, rajan and drum simultaneously found common storage device for drinking water in hotels i.e., 41.66 %. The workers prefer to serve drinking water by hand. The method of handling drinking water by jug is very common.

Thus, on an average percentage of middle class people living in Amravati district is high. Therefore their standard of living is low. High class hotels are too expensive to be afforded by these middle class people.

CONCLUSION

Study reveals that good class and reasonably good quality hotels maintains their hygienic condition. Improper method of storage and handling of drinking water of roadside stalls makes it more contaminated. If the drinking water is contaminated once, it will lead to water born outbreak at the hotel mainly in the form of gastrointestinal infection to those who consume the contaminated drinking water. Therefore Hotel owner and workers should maintain the hygienic conditions in order to avoid contamination of drinking water.

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