# Effect of Water-Guard on Bacterial Load in Drinking Water

**Legese Hagos*[1], Nen Opadhi[2], Yasin Oljira[2] and Monday Akway[2]**

[1]*Jimma Agricultural Research Center, Ethiopia*

[2]*Jimma University, Ethiopia*

***Corresponding Author:** Legese Hagos, Jimma Agricultural Research Center, Ethiopia*

## ABSTRACT

*Water is the most important thing for the existing earth and also known to serve as a route for transmission of water borne diseases worldwide most especially in the developing countries. The current study was initiated to evaluate the effect of water-guard in drinking water. Nutrient agar was used to isolate bacterial colonies from water-guard treated drinking water and untreated one. The result revealed that there was high difference in bacterial colonies among treated and untreated drinking water that untreated one contained 165,131 and 148 bacterial colonies from replication 1,2, and 3, respectively. In the other hand, treated water contained very low bacterial colonies that 4,6,5 from replication 1, 2,and 3 respectively. Treating with water-guard is highly recommended for risk minimization that if the number of bacterial colony is high the opportunity to get pathogenic bacteria or water borne diseases can be also high.*

**Keywords:** *Microbial load, treatment, water, water-guard*

## INTRODUCTION

Water is known to serve as a route for transmission of water borne diseases worldwide most especially in the developing countries. According to (WHO, 2004) reported that an estimation of over one billion people lack access to improved water sources. Contaminated drinking water contributes substantially to the 3–5 billion episodes of diarrhea that occur annually, 80% of which occur among children aged <5 years (Ford, 1999), and Contaminated drinking water kill over two million people (Kosek *et al*., 2003).WHO estimates that up to 80% of ill-health in developing countries is water and sanitation related. Only 61% of people in developing countries are estimated to have access to a water supply, greater in rural than urban areas and 36% to sanitation facilities, greater in urban than rural areas (WHO., 1998, 2003, 2007). Most of the mortality and morbidity associated with Water-related diseases in developing countries is due directly or indirectly to infectious agents (Cheesbrough, 2000).

"Water guard" is being used today as an alternative means of making water safe for human use. It is a greenish yellow liquid that is prepared by reacting dilute caustic soda solution with liquid or gaseous chlorine accompanied by cooling and is used as a disinfectant in water and wastewater treatment, swimming pool and sanitary equipment among other uses. It has been found to be highly effective for bacteria, somewhat effective for viruses, most protozoa, and helminthes and not effective for Cryptosporidium oocysts, toxoplasma oocysts, turbidity, chemicals, taste, odor and color (CDCP, 2007).

The need for purified are higher because people always want to be healthy and different chemical treatment for disinfecting the water are among the safety issue and pure water is not evenly available to all population ,still using untreated water are progressing increase due to unaware to pathogenic bacteria as well as losing alternative of escaping out of using water ,people pressing on untreated and disease are also emerging as waterborne ,therefore find answer to this very problem is highly encourage so as to reduce microbial load that lead to likely reduce waterborne disease. Therefore, the current research was initiated with the objective of evaluation of effect of water-guard on microbial load of drinking water.

## MATERIAL AND METHOD

### The Study Area

The study was conducted in Jimma town, which is located at 333km southwest of Addis Ababa, Ethiopia.

### Sampling Techniques and Sample Collection

The samples of drinking water were randomly selected and taken to the microbiology laboratory.

## Isolation of Bacteria from Water-Guard Treated Water and Untreated Water

Nutrient agar medium was prepared and autoclaved autoclave at 121°C. Twenty ml of sterilized medium was poured to sterilized petridishes and allowed to cool to solidify for 30 minutes. After the media has solidified, one ml of water-guard treated drinking water was inoculated in to three replication of petridishes containing sterilized nutrient agar media and at the same time water-guard untreated drinking water was inoculated in to another three replication of petridishes containing sterilized nutrient agar media and spread plated. Then, the plates were transferred to an incubator that adjusted at 30°C for 24 hours. The growing bacterial colony were counted after 24 hours of incubation.

## RESULTS

The result revealed that there was differences in bacterial colony numbers of treated and untreated drinking water (Fig.1 and 2).



**Fig1.** *Water-guard untreated water bacterial colonies*



**Fig2.** *Water guard treated water bacterial colonies*

**Table.** *Number of bacterial colonies on treated and untreated drinking water*

| Treatment | Replication1. number of bacterial colonies | Replication 2.number of bacterial colonies | Replication3. number of bacterial colonies | Mean |
|---|---|---|---|---|
| Untreated water | 4 | 6 | 5 | 5 |
| Treated water | 165 | 131 | 148 | 148 |

## DISCUSSION

The study showed that untreated water contained more of bacterial load than that of treated water. This is because of untreated water is exposed to more microbes during transportation and storage. Since water is treated around ready to drink, it highly minimizes the bacterial load which some of them may cause water born diseases. Consumption of untreated water is highly exposed also for diarrheal diseases. Therefore, diseases associated with contaminated water will cause heavy economic load in the developing countries, both on the public health care system for treatment and on persons affected for transport to clinics, medicines and lost productivity. Water is known

to serve as a route for transmission of water borne diseases worldwide most especially in the developing countries. WHO estimates that up to 80% of ill-health in developing countries is water and sanitation related. Only 61% of people in developing countries are estimated to have access to a water supply, and 36% to sanitation facilities, greater in urban than rural areas (WHO., 1998, 2003, 2007).

## CONCLUSION

The study shows that untreated water contained more of microbial load in that a mean of 148 bacterial colonies while treated water contained a mean of 5 bacterial colonies. As comparable to that of untreated water, Treating water at with water-guard at household level has been shown the most effective and safer that much more minimizes the risk of exposure to the risk of water bore diseased. Promoting household water treatment and safe storage (HWTS) helps vulnerable populations to take charge of their own water security by providing them with the knowledge and tools to treat their own drinking water.

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