ABSTRACT

Water used in the production of a good or service is known as virtual water. Safe drinking water is essential to humans and other life forms even though it provides no calories or organic nutrients. Access to safe drinking water has improved over the last decades in almost every part of the world, but approximately one billion people still lack access to safe water and over 2.5 billion lack access to adequate sanitation. From a biological standpoint, water has many distinct properties that are critical for the proliferation of life. It carries out this role by allowing organic compounds to react in ways that ultimately allow replication. Photosynthetic cells use the sun's energy to split off water's hydrogen from oxygen. Hydrogen is combined with CO\(_2\) (absorbed from air or water) to form glucose and release oxygen. The water industry provides drinking water and wastewater services (including sewage treatment) to households and industry. Water supply facilities include water wells, cisterns for rainwater harvesting, water supply networks, and water purification facilities, water tanks, water towers, water pipes including old aqueducts. Atmospheric water generators are in development. Water covers 71% of the Earth’s surface, which is vital for all known forms of life. Only 2.5% of this water is fresh water, and 98.8% of that water is in ice and groundwater. Water can support the growth of many types of microorganisms which can be useful as well as harmful for all livings. This study is based on the finding of the checking of the safety of filter water at the particular area where we studied and tested. The different code no represent as A, B, C and D. The Petri plate was prepared by containing media and the different samples were soaked in antibiotic disc and placed over the media. The study was
conducted to check the microbial population, and was done successfully by observing the microbial growth at regular intervals. Our research findings conclude that the water sample B was found safer for drinking as comparison to the other water samples as A, C, D. At the same time we also tested AMAN AQUA Mineral Water and it was found safe for drinking with zero microbial growth.

**KEYWORDS**: Samples, Dilution Series, Isolates, Biochemical Analysis, Data Monitoring, Result Analysis.

**INTRODUCTION**

Water is a translucent fluid which forms the world’s streams, lakes, oceans and rain, and is the major constituent of the fluids of organisms. Water in three states: liquid, solid (ice), and gas (water vapor). Water covers 71% of the Earth’s surface, which is vital for all known forms of life. Only 2.5% of this water is freshwater and 98.8% of that water is in ice and groundwater. Water on Earth moves continue through the water cycle of evaporation and transpiration, condensation, precipitation, and runoff, usually reaching the sea.[1,3] Water is been used for many purposes for drinking, production of good or service, sanitation, life support (aquatic), agriculture etc. it means there is no life without water as; all living things require water as solvent in which many of the body’s solute dissolves and as an essential part of many metabolic processes within the body.[2-5] Water is life, but sadly more than a billion people globally do not have access to safe water. Lack of safe water results in untold suffering, diseases, infant mortality, stunted growth and economic loss.

Water can support the growth of many types of microorganisms, which can be useful as well as harmful for all livings. This can be advantageous; for example, the chemical activities of certain strains of yeast provide us with beer and bread.[6-9,12] As well, the growth of some bacteria in contaminated water can help digest the poisons from the water. But at the same time this microorganism are responsible for the illness and can be fatal. A common example is contamination of drinking water with a type of *Escherichia coli* known as O157:H7 can be fatal. Hygienic and microbiological examinations of watercourses are usually not carried out during heavy rainfall and runoff events.[10-11] This study is based on the microbial growth in the filter water of the university.
MATERIALS AND METHODS
In our study, a series of tests already been performed to detect coliform organism in a water sample and to estimate their numbers. The membrane filter technique also is utilized to detect water borne bacteria of different places of surrounding. The water samples were collected from the purifier at MATS University, Pandri, Raipur. The samples were collected in the sterile tubes and were brought to the laboratory. The Petri plate was prepared, containing media and the different samples were soaked in disc and placed over the media.

Media Preparation
NAM- Nutrient Agar Media was used to check the bacterial growth in the taken water samples.

PDA- Potato Dextrose Agar was used to check the fungal growth in the taken water samples.

Plating Technique
The plate was equally divided into four parts for the counting of the colony formed after incubation. The four parts of the plates were marked as A, B, C and D. The different letters represent the four different samples A, B, C, and D. We made disc of blotting paper and those discs were dipped in the different water sample. As soon as the blotting paper soaked the sample, disc placed in the plate marked as A, B, C and D respectively. The incubation provided was at 37°C for the bacterial growth and 25°C for the fungal growth. The period of incubation was 24-72 hours and the growth was observed at the interval of 24 hours.

RESULT AND OBSERVATION
After the incubation of 24 hours some colonies of the bacteria was visible and was further kept in the incubator to see growth. The plates were checked for the growth of the bacterial and fungal colonies.

Photograph showing bacterial growth
Photograph showing no bacterial growth

Photograph showing no funga growth

Photograph showing fungal growth

Zones formed by Bacteria
Bacterial colony formed a zone ring around the disc, after the incubation period of 72 hours.
The colony formed around the disc was observed and the diameter of the colonies was noted down.

Observation Table

<table>
<thead>
<tr>
<th>Code of the Samples</th>
<th>Diameter of the colonies (in cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C1</td>
</tr>
<tr>
<td>A</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>0</td>
</tr>
<tr>
<td>D</td>
<td>0</td>
</tr>
</tbody>
</table>
Water sample collected from different filter was containing bacteria in it. Some of the sample was more contaminated as compared to other one. One of the water samples was mineral water aman aqua and the quality of the mineral water was checked with zero contamination or no bacterial growth. By the control we obtained that the media was not contaminated and suitable for the test of bacteria growth (NAM).

By the comparison between the water samples along with mineral water, it was observed that the A, C, D are more contaminated as compare to B.

**Zone formed by Fungus**
Fungal colony formed a zone ring around the disc, after the incubation period of 72 hours. The colony formed around the disc was observed and the diameter of the colonies was noted down.

**Observation Table**

<table>
<thead>
<tr>
<th>Code of the Samples</th>
<th>Diameter of the colonies (in cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C1</td>
</tr>
<tr>
<td>A</td>
<td>1.7</td>
</tr>
<tr>
<td>B</td>
<td>1.4</td>
</tr>
<tr>
<td>C</td>
<td>1.5</td>
</tr>
<tr>
<td>D</td>
<td>1.3</td>
</tr>
</tbody>
</table>

**DISCUSSION AND CONCLUSION**
Water may be the vehicle for transferring a broad variety of microbial diseases, including typhoid fever, cholera, amoebiasis and traveler’s diarrhea. Because it is virtually impossible to test for the causative agents of these diseases, certain indicator organism have been recognized as signals to human waste in water. An important group of indicator organism is the coliform bacteria, a collection of gram negative nonspore forming rids that format lactose to acid and gas. One coliform, E. coli is found almost exclusive in human and animal waste. Its presence in water provides evidence that other intestinal organisms may also be present and that the water may also be present and that the water may be unfit for human consumption. The water samples that were targeted in this study were found to be contaminated by the various bacterial and fungal colonies. The study was conducted to check the microbial population and was done successfully by observing the microbial growth. The water sample B was less contaminated by bacteria and fungus but the other samples A, C and D showed large colonial growth for both bacteria and fungus. The contamination especially fungus growth was found more in the sample water and the mineral water taken for
comparison was found fit, safe and healthy for drinking. Our finding conclude that, the water sample B was found more safe for drinking as comparison to the other water samples A, C, D and the mineral water AMAN AQUA was also tested; and found safe for drinking with zero microbial growth. The large amount of growth in the filter water concludes that the water is not good for consumption and could lead to many health issues. Many infectious microorganisms might be present in the filter which can cause diseases like jaundice, cholera, enteric colitis, etc.

The water was found unhygienic for drinking; it might be because of the improper functioning of the filter. Another reason can be the management irresponsibility towards the hygiene of the students and other members. A proper maintenance of the filter is required as it is the life line of every individual and is the basic requirement for all of us.

ACKNOWLEDGEMENT
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REFERENCES


