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Antibacterial Activity of *Emblica Officinalis* against Bacterial Pathogen Isolated from Bore Water

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Abstract: ***The present study was undertaken to determine the invitro antibacterial activity of three extracts of leaves, fruits and seeds of Emblica officinalis was done by agar well diffusion method against seven test bacterial species such as Pseudomonas aeruginosa, klebsiella pneumonia, Escherichia coli, Proteus vulgaris, Shigella flexneri, Staphylococcus aureus, Salmonella paratyphi A isolated from bore water. The different concentration of plant extract were used for this tests were 100µl, 150µl, 200µl. And the present study disclosed the importance of traditional water purification technology to control pathogenic bacteria from bore water includes disinfection of water at affordable cost and methods using naturally available herbal leaves, fruits, and seeds. The aqueous extract of Emblica officinalis was effective against all the test bacterial species.***

Keywords: Emblica officinalis, Anti microbial activity, Agar well diffusion

1. Introduction

Water is the most common liquid on earth. It covers about 71.4 % of the earth pure water has no smell, taste, or colour. Lakes, oceans, and rivers are made of water. Rain is the water that falls from clouds in the sky. If water gets very cold below 0°C it freezes and becomes ice. If water gets very hot above 100°C it boils and becomes stream. Water is very important for life. Only about 3% of all the water on earth is fresh water. The rest is salt water and is used for a variety of purpose such as drinking, washing, bathing, recreation, as well as numerous applications.

World Health Organization Report

World health organization WHO reports that wholesomeness of water means absence of suspended solids, inorganic solids and pathogens.96.5% of the planet's water is found in oceans, 1.7% in ground water and in glaciers and the ice caps of Antarctica and Greenland a small fraction in other water bodies and 0.003% in the air as vapour clouds and precipitation only 2.5% of the earth water is fresh water and 98.8% of the that water is in ice and groundwater less than 0.3% of all fresh water is in river, lakes and the atmosphere, and in smaller amount of the earth's fresh water (0.003%) is contained within biological bodies and manufactured products. ***Gleick, PH., et al 1993***.

Water is one of the most essential requirements of life. Without water there cannot be life. Unfortunately water gets contaminated by chemicals as well as microorganism. Sources of chemical polluted in industrial waste where as that of microbial pollution are domestic and storm waste. Polluted water is responsible for spread of water borne disease. So it is necessary to analyse the present environment.

Ground Water

Ground water consists of 97% of global fresh water and many regions, ground water sources of the single largest supply for serving drinking water to the community. ***Dattatraya Bharti., et al 2011.***

Plants animals and human are mostly water inside and must drink water to live. It gives a medium for chemical reaction to take place and is the main part of the blood. It helps blood carry nutrients from the stomach to all parts of the body to keep the body alive. Water also helps the blood carry oxygen from the lungs to the body. The human body consists of 60% to 70% of water.

Due to human and industrial activity the ground water gets contaminated. This is serious problem nowadays. Thus the analysis of water quality is very important to preserve the ecosystem. The assessment of ground water quality was carried out in the different area. ***Devendra Dohare, et al may 2014.***

Ground water is also one of our most important sources of water for irrigation. Unfortunately ground water is susceptible to pollutants. It occurs when man-made products such as gasoline, oil, road salt sand chemicals gets into the ground water and cause it to become unsafe and unfit for human use.

Materials from the land's surface can move through the soil and end up in the groundwater example, pesticides and fertilizers can find their way into groundwater. It is possible for untreated waste from septic tanks and toxic chemicals from underground storage tanks and leaky landfills to contaminate groundwater.

Drinking contaminated ground water can have serious health effects. Diseases such as hepatitis and dysentery may be caused by contaminated from septic tank waste. Poisoning may be caused by toxins that have leached in to well water supplies. Wildlife can also be harmed by contaminated groundwater.

Common pathogenic microbes, such as *Salmonella sp*, and the most common disease agent is *Giardia lamblia* a parasitic protozoan are the common in faecal material of many fauna including humans. This microbe is particularly insidious due to its resistance to conventional sewage treatment.

Safe drinking water is essential for healthy living. Water

borne disease affect rural women and children and most of the seasonal diseases are due to impure water.

Urban people in our country gets purified water which is merely chemical and does not carry germs.

But unfortunately, they are devoid of natural properties of water the elixir of life. Researchers and scientist are exploring possibilities of finding solutions for water purification from science and technology including solar power.

For e.g.: UNICEF has discovered that one of the best way of getting clean drinking water without wasting any energy is keeping the water in glass bottle on sunny roof for 10hrs, in which the sun kills 99.9% of deadly *E.coli* bacteria.

Traditional water purification technology and conventional method used by agrarian and indigenous communities in the past. Our younger generation does not know the traditional method opt for "mineral water" sold in market and ignore our glorious past. It has been proven that traditional techniques are capable of removing acidic component from the water and there by brings about a balance pH.

In India contaminated drinking water, polluted river and unsafe well water remains major cause of morbidity and mortality in rural area with 1.8 million deaths per year being attributed to water borne disease. This victims are rural women and children living in villages and hamlets due to seasonal disease caused by contaminated drinking water. In Tamilnadu the situation is worse because of the increase in child mortality caused by water borne diseases.

Our rural and indigenous communities have forgotten our ancient wisdom, traditional science and ignored our cultural heritage. Lack of access to clean water remains a big challenge in rural pockets since modernization of agriculture and chemical fertilizers and pesticides have caused immense damage to soil, water resources and people

Today, large scale water supply systems depend on surface water and smaller water system depends on ground water. The contaminated drinking water can causes a range of diseases such as gastrointestinal illness. Rural women and children are particularly sensitive to microbial contaminants because their immune are weaker than those of adults. Children are sensitive to lead, which affects brain development.

In India many plants are used as traditional medicines for the treatment of various infective diseases. In small villages people use those medicinal plants for the treatment of some common infection. The active ingredients present in those plants are highly used for curing the diseases. ***Shweta Chauhan., et al 2015***

Bore Water

Bore water is groundwater that has been accessed by drilling a bore into underground water storages called aquifers. It is formed when water from rain and river seeps through layers of soil and rock fills spaces or fractured rock. This stored water moves very slowly through aquifers and can often be accessed by drilling a water bore and pumping to the surface.

Aquifers may contain chemicals and micro-organism that are potentially harmful. Some of these chemicals are naturally occurring (such as those present in soils and rocks) while others are result of contamination.

A deep bore is usually overlain by more than twenty metres of soil and clay. This material acts as a filter, preventing microbial contamination. Deep aquifers may protect from the surface by impermeable layers of materials such as rock or clay.

Water Quality

The microbiological quality of water in deep or confined aquifers is generally very good. This water quality will be retained if the bore is properly constructed, though its microbiological quality may be good, water in these aquifers can contain high concentrations of naturally occurring hazardous chemicals.

Shallow, unconfined aquifers are not protected by thick layers of soils and clays and are susceptible to both chemical and microbiological contamination. The use of these aquifers is generally not recommended as a suitable source of drinking water, particularly in urban areas.

Medicinal Plants

Tamari nelumbium or nelumbo nucifera introduced in well, pond and in biowastes to cleanse all impurities in water and to remove bad odour. Our ancestors introduced the lotus in all well and ponds in villages where drinking water is drawn.

Drumstick (Moringa oleifera) one of the common trees in Tamilnadu is medicinal tree. Green leaves, barks, roots, flowers, seeds and the drumstick are invariably used by local people in Tamilnadu. Moringa seed powder is being assessed for its potential to make river water potable. The seeds can be used to purify turbid and muddy water. It contains significant quantities of water soluble proteins. When crushed seeds are added to raw water, the protein produced a positive charge which acts like magnetic attracting particles like clay, slit, bacteria, and other toxic particles.

Thethankottai (Strychnos potatorum) is a wonderful seed found abundantly in the Western Ghats mountain region in Tamilnadu and still indigenous communities use the seed as natural coagulant to clean impure water.

Cherankottai (semecarpus anacardium) the deciduous tree is used for medicinal purpose. The seeds are powdered and a paste is made to dissolve in water. We get pure drinking water instantly. Tribal communities still practice the method.

Vettiver (vetiveria zizanoides) this is aromatic grass is grown on the banks of river and near ponds. Roots can be

used to purify water for a fragrance. ***Sushrutasamhita., et al 2002***

Among the common medicinal plant *Emblica officinalis* plays a crucial rolein purifying the water. Emblica officinalis is a deciduous tree, commonly known as Indian Goose berry or amla and nelli inTamil.

It belongs to family Phyllanthaceae. It is widely grown in all over India. The fruits are edible and pale yellowish and fleshy in nature. It is highest source of natural vitamin C.

Botonical Name	:	Phyllanthus Emblica fruit
English	:	Indian gooseberry
Telugu	:	Ustrika
Malayalam	:	Nellikay
Sanscrit	:	Amalaki
Hindi	:	Amlika

Scientific classification

Kingdom	:	plantae
Order	:	Malpighiales
Family	:	Phyllanthaceae
Genus	:	Phyllanthus
Species	:	P.Emblica

2. Aim & Objective

The aim of the project is to rediscover our ancient, traditional methods of sustainable water purification using locally available herbs such as amla, which is high in vitamin C. They were often used in well filtration, to purify water.

2.1 Objective

- To prepare extract of *Emblica officinalis* from leaves, seeds and fruits.
- To isolate bacteria from Bore-water by serial dilution and spread plate technique.
- To study the anti-bacterial activity of Leaf, Fruit and seed extracts of *Emblica officinalis* against the isolated bacteria by Agar well diffusion Method and analyse the results by measuring the zone.

3. Materials and Methods

- *Emblica officinalis fruit*
- *Emblica officinalis leaves*
- *Emblica officinalis seeds*
- Microwave oven
- Whatman No.1 filter paper
- Blender
- Laminar airflow
- Water sample collected from3areas
- Nutrientagar
- Muller Hinton Agar
- Distilled water
- Sterile Petriplates
- Test tubes
- Micropipette
- Tipbox
- Spatula
- Inoculation loop
- Glass slide and cavity slide
- Microscope

3.1 Methodology

3.1.1 Plant Material Collection

Fruits of *Emblica officinalis* were collected from local market**.** And leaves were collected from St. Ebba's Hr. Sec School campus. Mylapore Chennai district, Tamilnadu, India. Bacterial Strains were isolated from bore well water. The bacterial strains were maintained on Nutrient agar plates or Slants and were stored at 4°c before use.

3.1.2 Sterilization of the samples

The fruits, leaves were ensure that they are healthy and un infected and seeds were taken out by boiling the fruits they were washed in running tap water for 10 minutes. Then rinsed with distilled water. The fruits were made into small pieces.

3.1.3 Preparation of extracts

The cleaned and cut fruits and seeds were taken and oven dried at 60° continuously for 7days. The dried samples were taken and powdered using a clean blender and 5g of samples were taken and extracted with 100ml of sterile distilled water. There after it was filtered with the help of what man no.1filter paper. The filtrate was collected and stored at 4°c for further use.

3.1.4 Isolation of organism from bore water

Bore water samples were collected in three nearby areas Royapettah, Mylapore and Triplicane. The water samples were collected in a sterile container and serial dilutions were performed and in that 4, 5, and 6th dilution tubes were taken spread plate method were done in nutrient agar plate.

The plates were kept for incubation at 37°C for 24hrs overnight. After incubation the different types of colonies were taken and morphology study were done and these isolated colonies were inoculated in saline or peptone water and incubated for half an hour and biochemical test, grams staining motility test were performed. The bacteria were identified.

Some differential media can also use to confirm the pathogen. Such as Eosin methylene blue agar, Salmonella Shigella agar, Thiosulphate citrate bile salt agar, Cystine lactose electrolyte deficient agar, Blood agar, Macconkey agar, Mannitol salt agar.

Biochemical test such as Indole, Methyl red, Vogesproskauer, Citrate, TSI, Urease, glucose, sucrose, lactose, manitol, maltose were performed. After the bacteria were isolated from water. The antibacterial activity was performed by Agar well diffusion method.

3.1.5 Agar Well Diffusion method

The effects of *Emblica officinalis* (gooseberry) Fruits, leaves, and seeds extract on seven bacterial strains were assayed by agar well diffusion method. Muller Hinton

agar was used as a base medium for screening of antibacterial activity.

Muller Hinton Agar were weighed and dissolved in distilled water and autoclave at 121°c for 15 min. The medium were cooled at room temperature and 10 to 20ml poured in sterile petriplate aseptically and that were allowed to solidify. After the agar gets solidify 3 wells were made and the cut agar was removed aseptically with the help of sterile forceps. The lawn of test bacterial strains were prepared And rest of the inoculum were removed aseptically by using micropipettes.

The prepared fruits, seeds and leaves extract were added in 100µl, 150µl and 200µl. then the plates were incubated aerobically at 37°c for 24 hours without inverting the plates. Control wells containing sterile distilled water were also incubated. After incubation the plates were taken out and result were recorded, as the presence or absence of inhibition zone.

The inhibitory zone around the well indicates the absence of bacterial growth that shows positive result and the absence of zone indicates the negative result. The antibacterial activity was assayed by measuring the diameter of the inhibition zone formed around the well, the diameter of the zone were measured in millimeter.

4. Results

The in-vitro antibacterial study of three extracts of leaves, fruits and seeds of *Emblica officinalis* was done by agar well diffusion method against the test bacterial species isolated from bore water and their activity potentials were qualitatively evaluated by the presence or absence of inhibition zones. The results of antibacterial assay three extract of *E.officinalis* are presented in the Table 5.1 to Table 5.7. The result specified in the table predicted that the *E.officinalis* had greater potential as an antibacterial agent against the tested bacterial species. It was found a regular increase in the zone of inhibition size with the increase in the concentration of extract in all bacterial strains. Zones of inhibition of *E.officinalis* against the test bacteria *Escherichia coli*, *Proteus vulgaris*, *Shigella flexneri*, *Staphylococcus aureus*, *Salmonella paratyphiA* sp was 6to7mm at 150µl concentration and 8mm to 9mm at 200µl concentration of the extract. The extract of Emblica officinalis is found to be effective against all the test bacterial sp. But Emblica officinalis seed extract shows zone only in *Salamonella para typhi A and Klebsiella P neumoniae.* The extract of fruit and leaves of Emblica officinalis are found to be effective against all the bacterial species isolated from bore water.

Table 5.1: Antibacterial effects of *Emblica officinalis* against *Pseudomonas aeruginosa*

Volume of extract Used	(Average diameter of zone of inhibition of growth in mm)		
	Leaves extract	Fruit extract	Seed extract
100µl	7	7	-
150µl	9	8	-
200µl	8	9	3

Table 5.2: Antibacterial effects of Emblica officinalis against *Klebsiella Pneumoniae*

Volume of extract Used	(Average diameter of zone of inhibition of growth in mm)		
	Leaves extract	Fruit extract	Seed extract
100µl	5	4	2
150µl	4	7	3
200µl	7	6	5

Table 5.3: Antibacterial effects of Emblica officinalis against *Escherichia coli*

Volume of extract Used	(Average diameter of zone of inhibition of growth in mm)		
	Leaves extract	Fruit extract	Seed extract
100µl	5	6	-
150µl	6	8	-
200µl	8	9	2

Table 5.4: Antibacterial effects of Emblica officinalis against *Proteus vulgaris*

Volume of extract Used	(Average diameter of zone of inhibition of growth in mm)		
	Leaves extract	Fruit extract	Seed extract
100µl	5	4	-
150µl	4	6	-
200 µl	7	8	-

Table 5.5: Antibacterial effects of Emblica officinalis against *Shigella flexneri*

Volume of extract Used	(Average diameter of zone of inhibition of growth in mm)		
	Leaves extract	Fruit extract	Seed extract
100µl	7	5	-
150µl	6	7	-
200µl	9	8	-

Table 5.6: Antibacterial effects of Emblica officinalis against *Staphylococcus aureus*

Volume of extract Used	(Average diameter of zone of inhibition of growth in mm)		
	Leaves extract	Fruit extract	Seed extract
100µl	5	6	-
150µl	7	5	-
200µl	9	8	-

- Sign indicates absence of zone

Table 5.7: Antibacterial effects of Emblica officinalis against *Salmonella paratyphiA*

Volume of extract Used	(Average diameter of zone of inhibition of growth in mm)		
	Leaves extract	Fruit extract	Seed extract
100µl	4	5	2
150µl	6	7	3
200µl	8	9	3

Figure 1: Emblica Officinalis Extracts

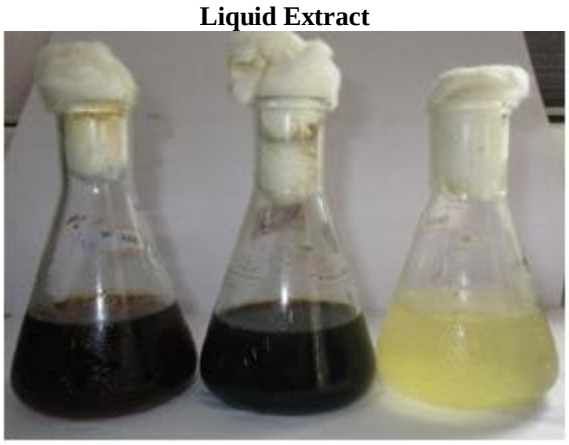
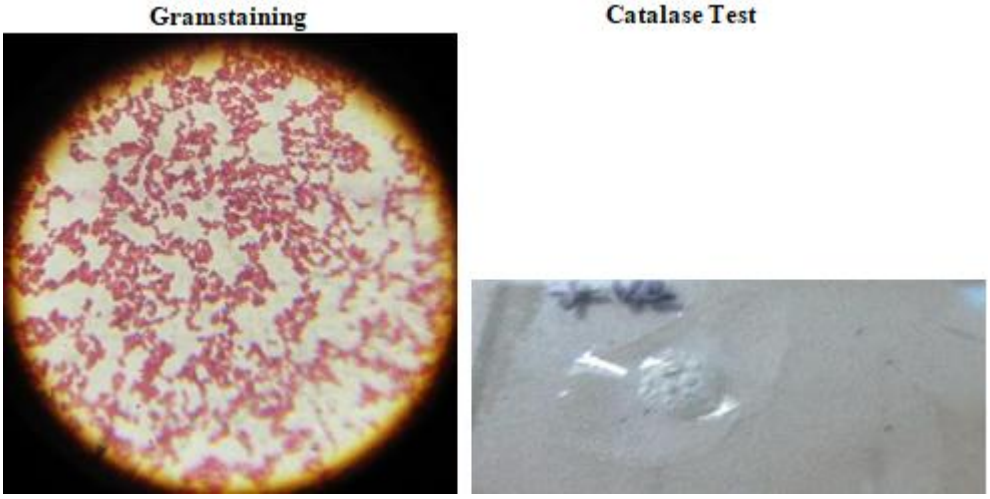
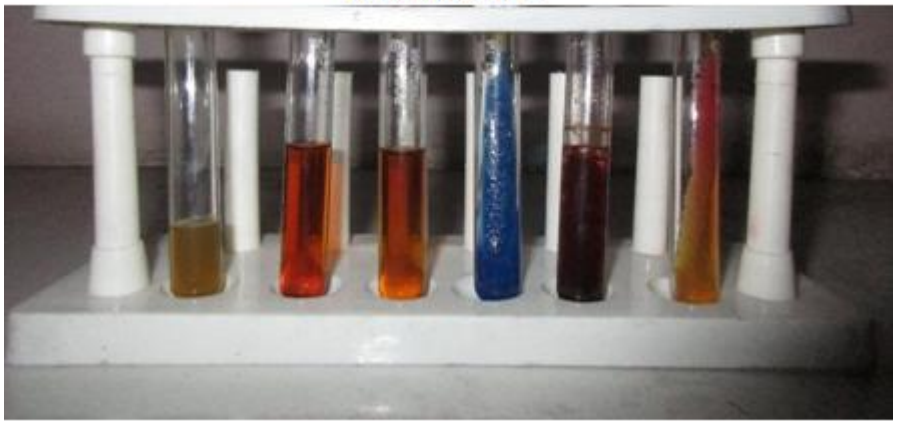


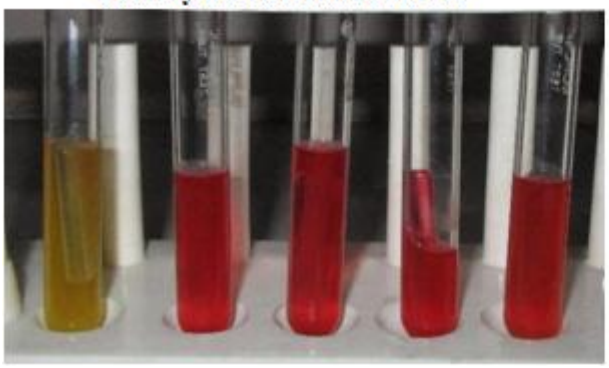
Figure 2: Pseudomonas aeruginosa



Biochemical test



Carbohydratefermentation Test **OF**



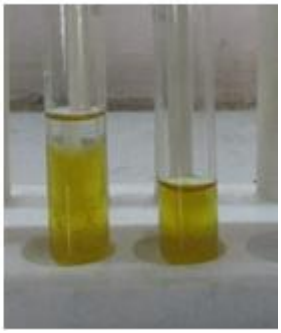
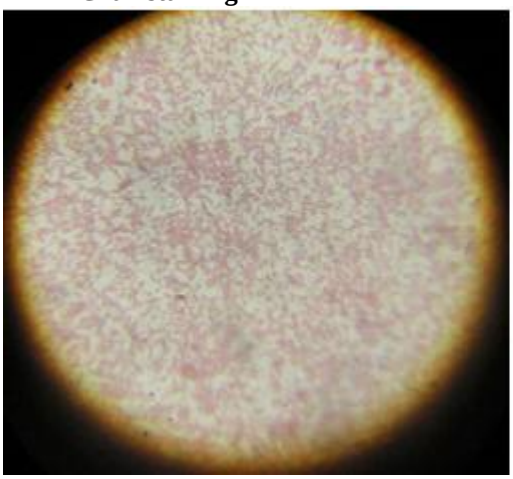


Figure 3: *KlebsiellaPneumoniae*

Gramstaining **Catalasetest**



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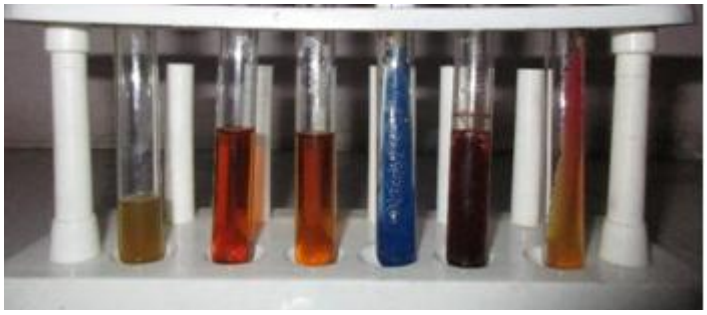

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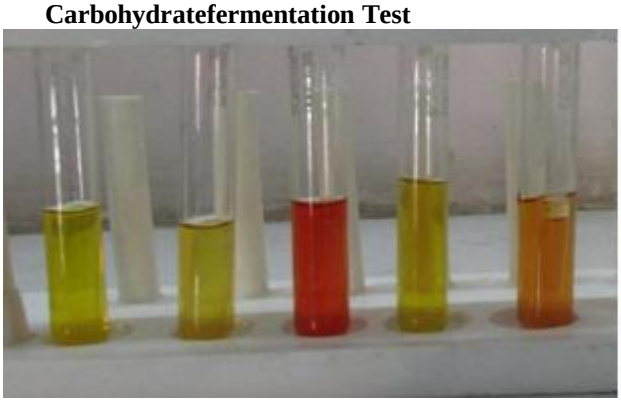
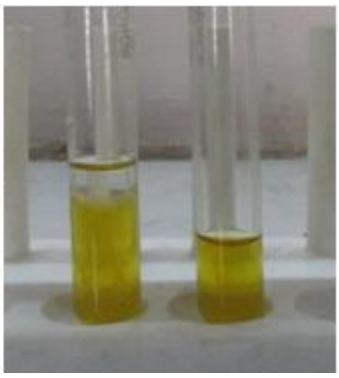
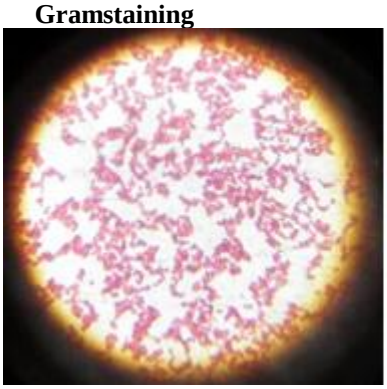



Gramstaining **Catalase Test**

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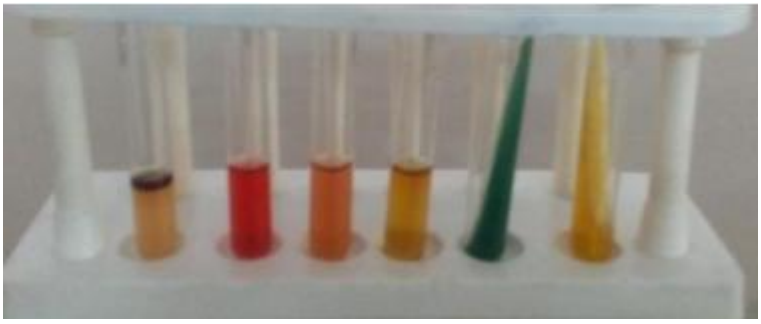

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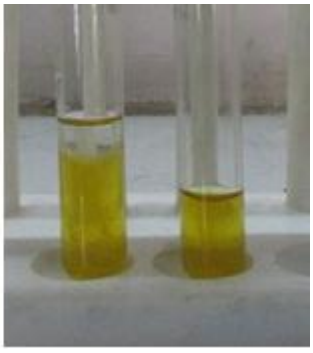

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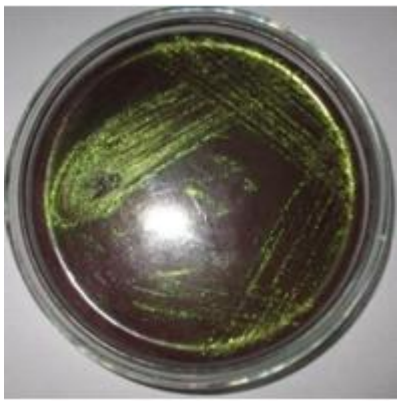
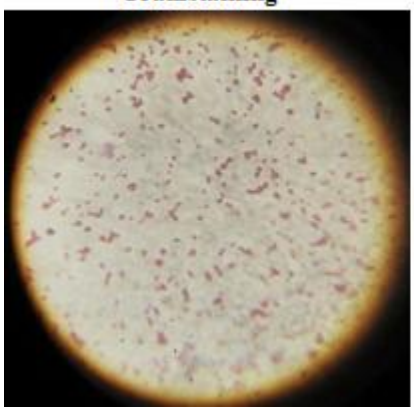


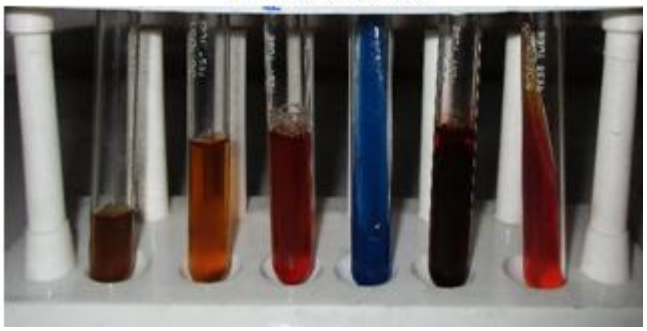
Figure 4 ***Escheria coli***

Gramstaining



Catalase Test

Biochemical test



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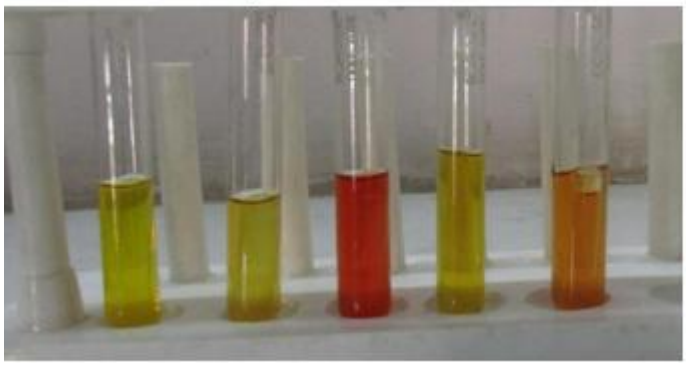

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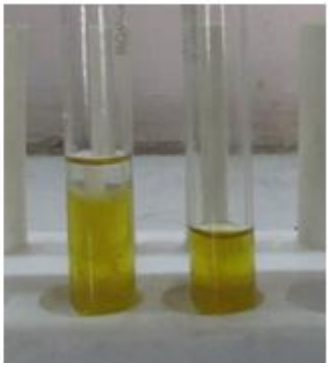


Figure 5: *Proteus vulgaris*

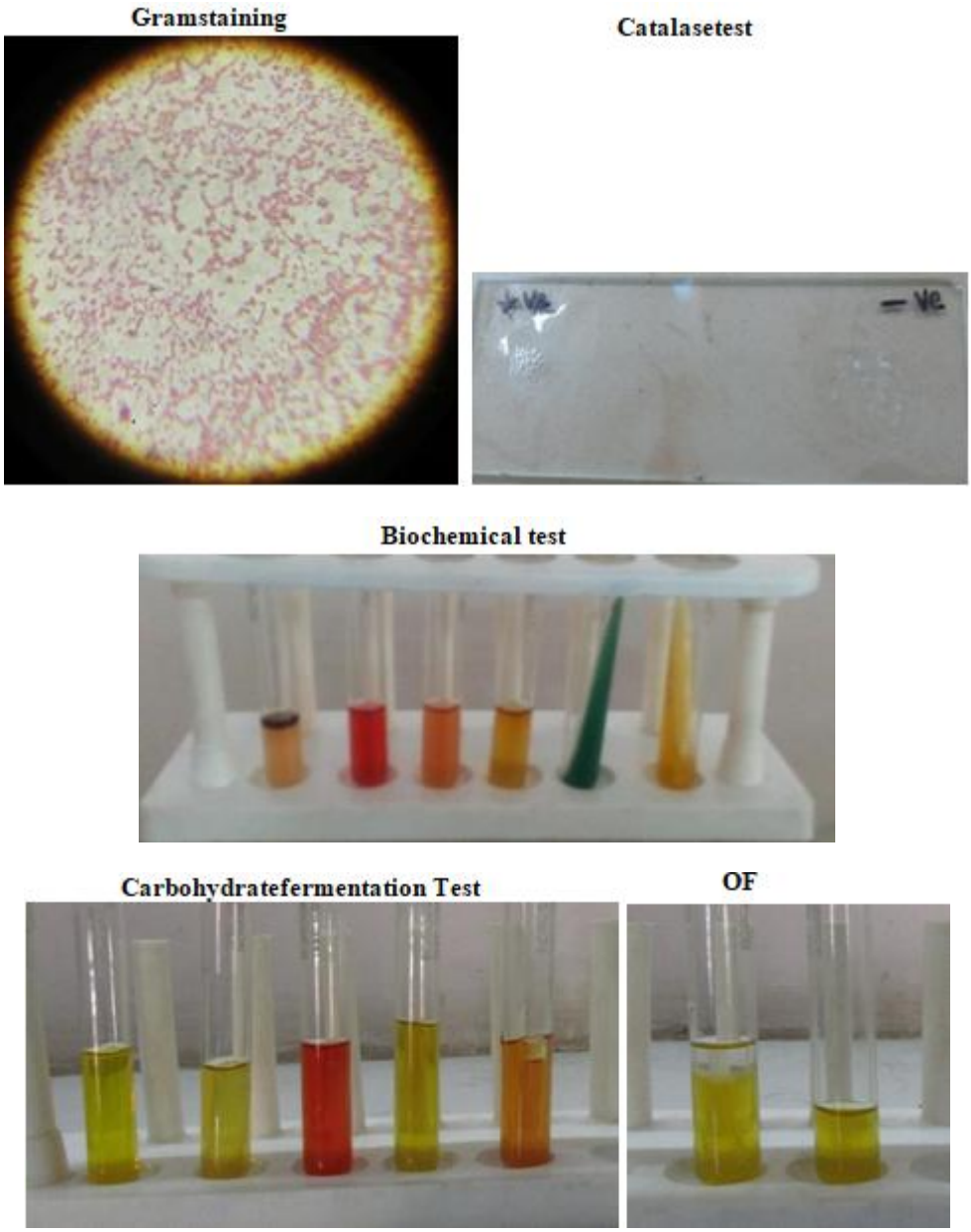
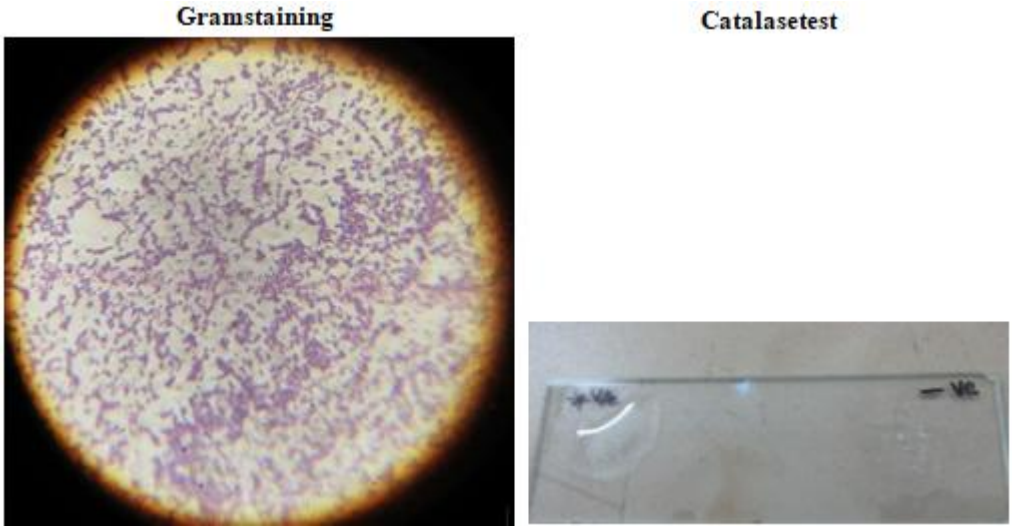


Figure 6: *Shigella flexneri*



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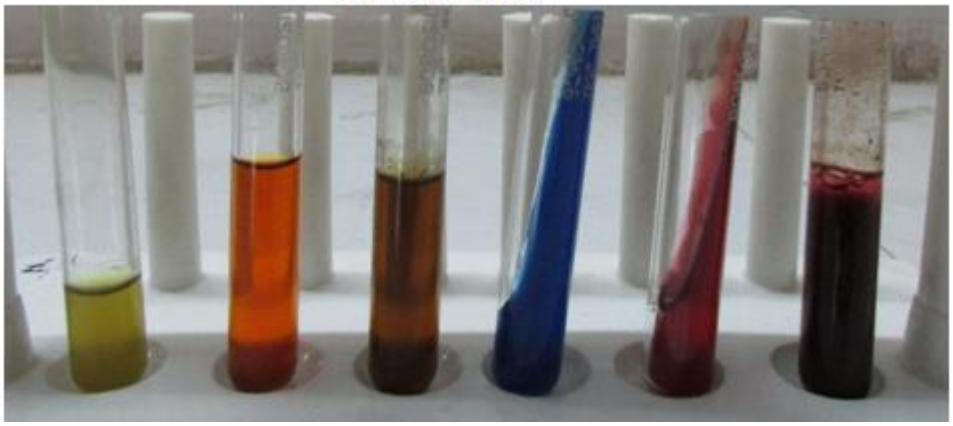
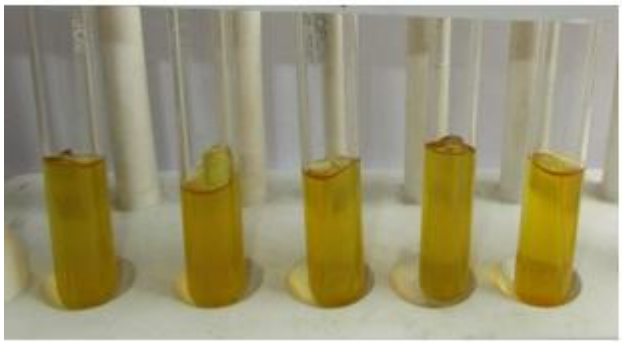


Carbohydratefermentation test



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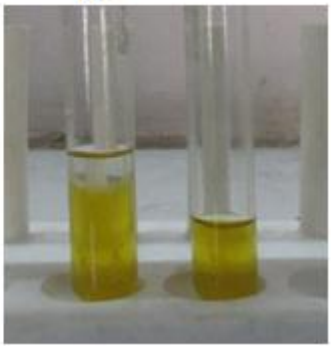
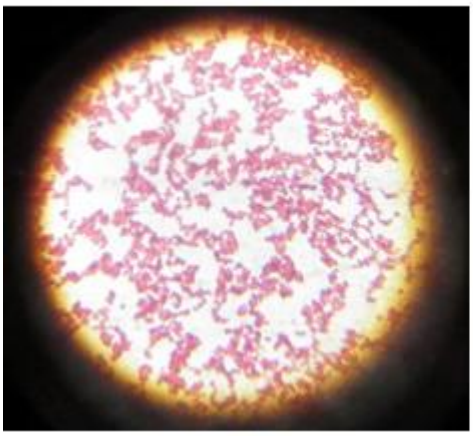


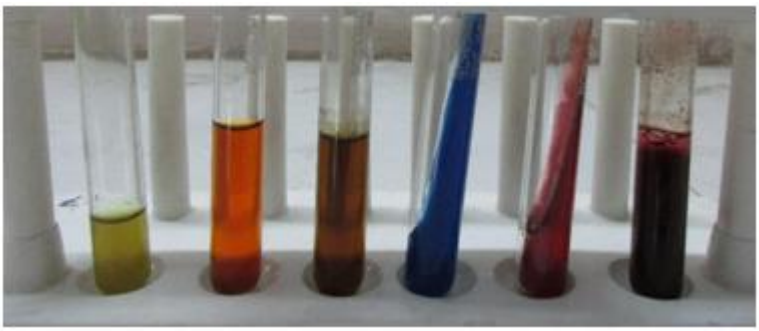
Figure 7: *Staphylococcus aureus*

Gramstaining



Catalasetest

Biochemical test



Carbohydrate fermentation Test **OF**

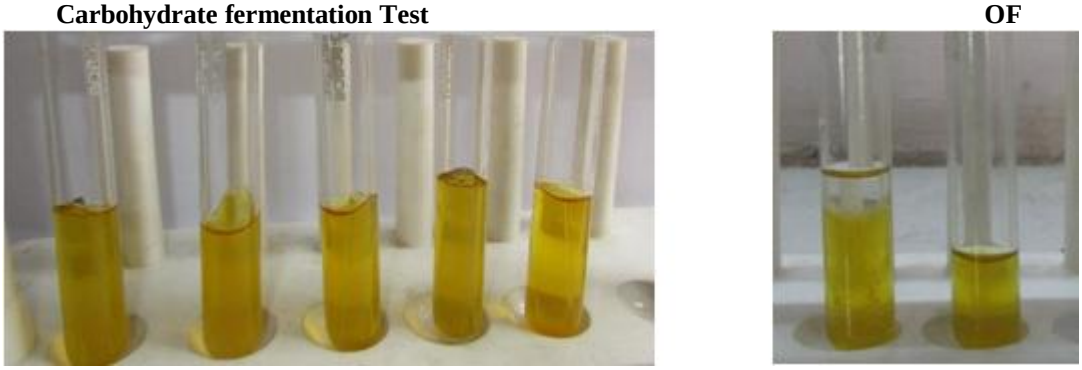


Figure 8: *Salmonella Paratyphi A*

Antibacterial Activity of Emblica Officinalis against Royapettah Water Sample

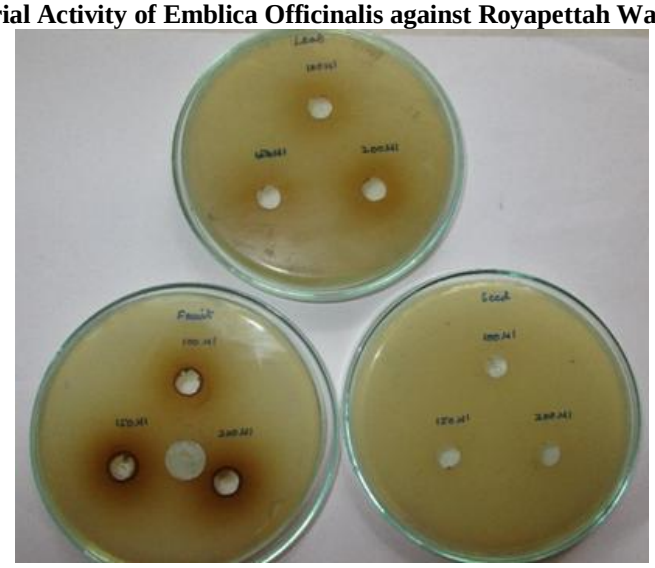


Figure 9 ***Pseudomonas aeruginosa***

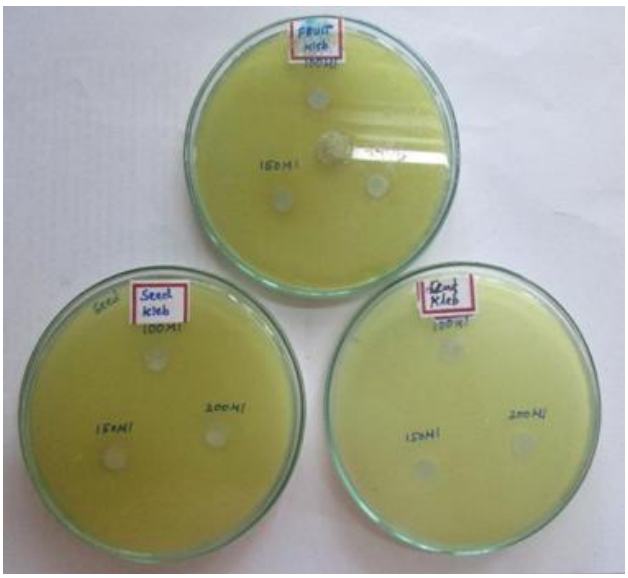


Figure 10 ***Klebsiella Pneumoniae***

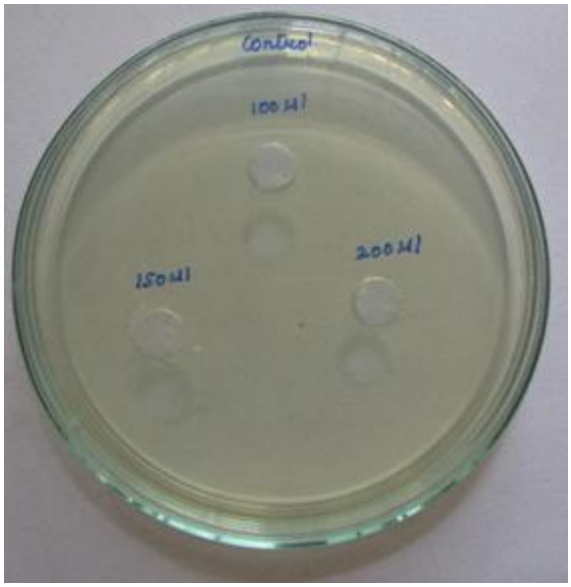


Figure 11: Control plate with sterile distilled water

Antibacterial Activity of Emblica Officinalis against Mylapore Water Sample

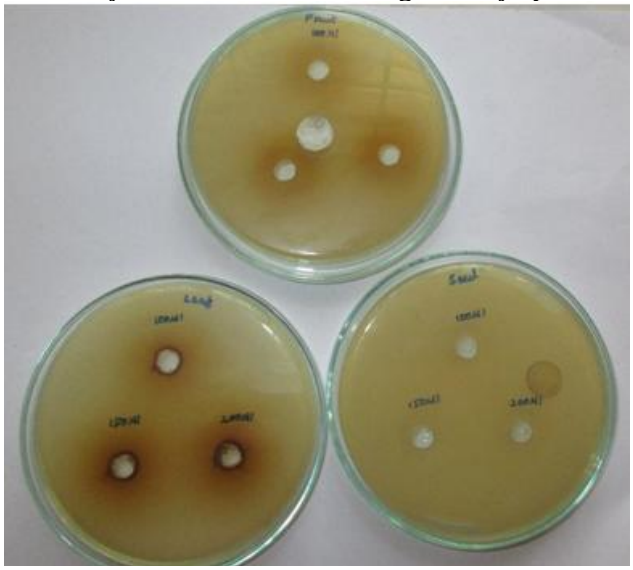


Figure 12: ***Escherichia coli***

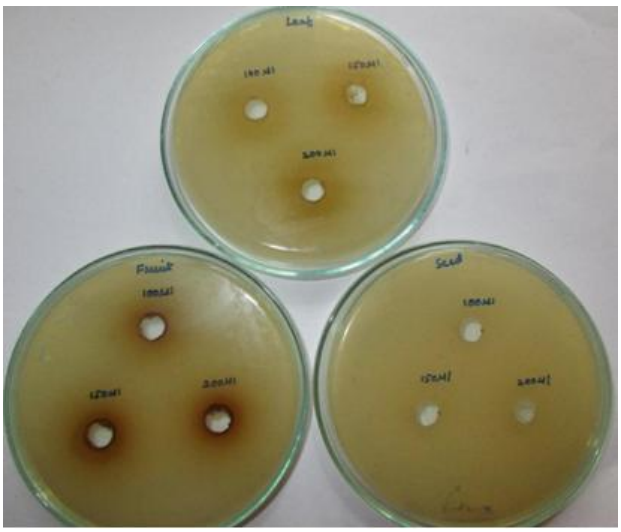


Figure 13: ***Proteus vulgaris***

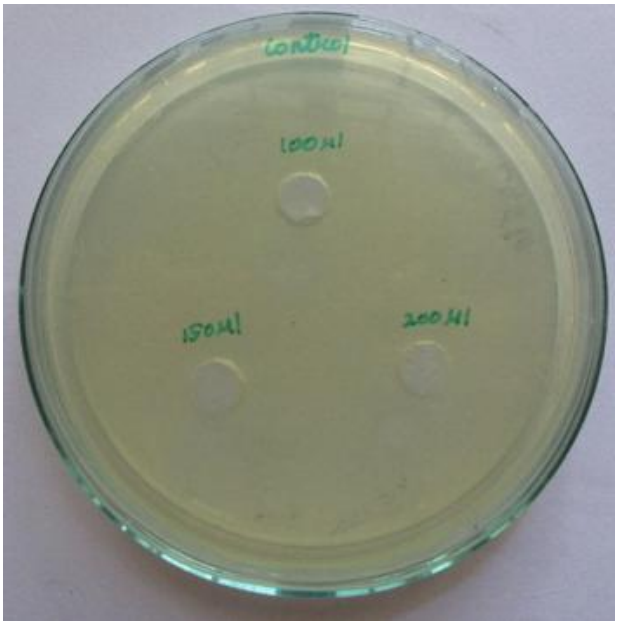


Figure 14: Control plate with sterile distilled water

Antibacterial Activity of Emblica Oficinalis against Triplicane Water Sample

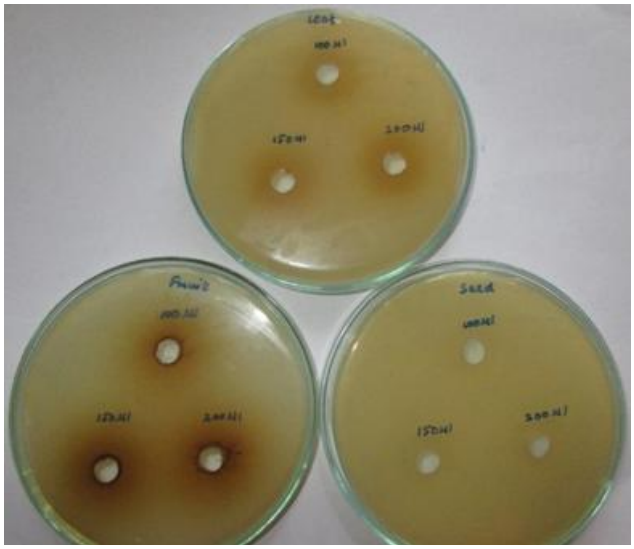


Figure 15: *Shigella flexneri*

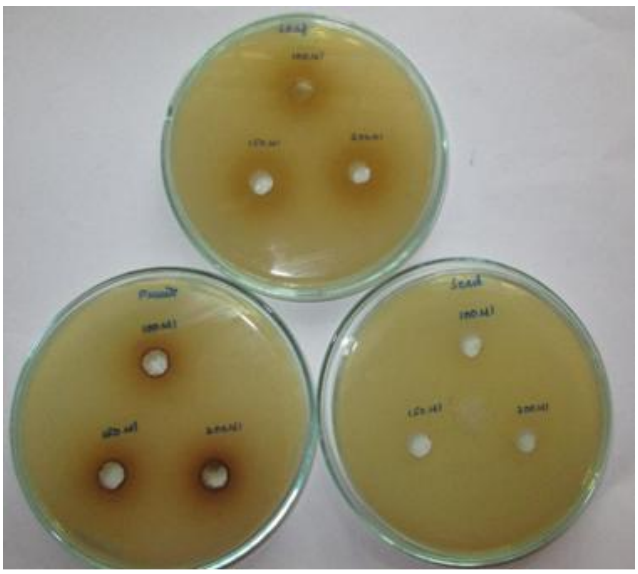


Figure 16: *Staphylococcus aureus*

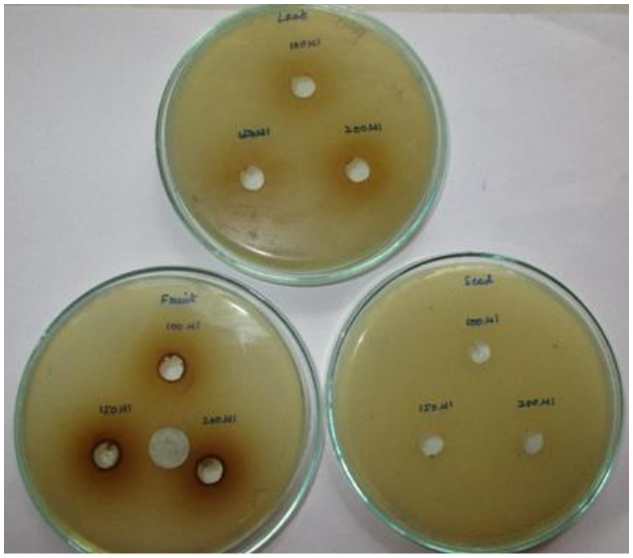


Figure 17: *Salmonella paratyphi A*

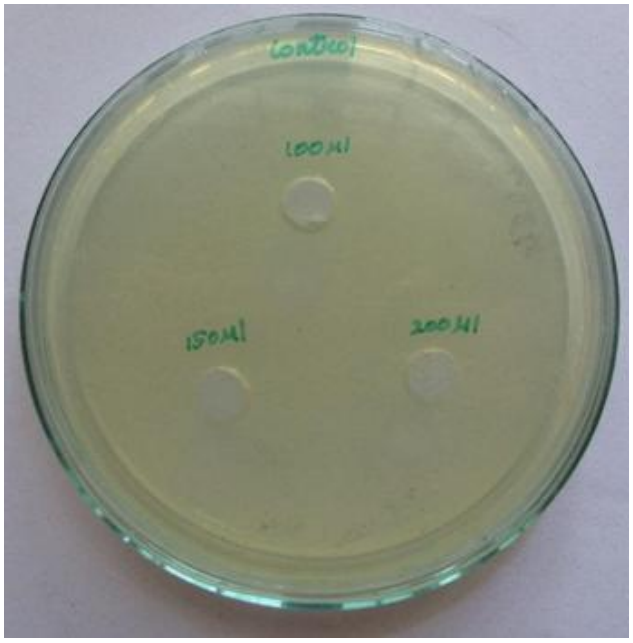


Figure 18: Control plate contain sterile distilled water

5. Discussion

The natural plant extract have been used for water purification for many centuries. Most of these extracts are derived from the leaves, fruit and seed extracts of trees. The traditional medicinal plant *Emblica officinalis* were effective for their utilization as a source of antibacterial compounds. Gooseberry is capable of removing fluoride from water. The walls on the periphery of wells in the villages were constructed with the help of gooseberry wood in the past.

The present study shows that the extract of *Emblica officinalis* exhibited antibacterial activity against the 7 bacterial sp, isolated from bore water namely *(pseudomonas aeruginosa, Salamonella para typhi A, KlebsiellaPneumoniae, proteus vulgaris, E.coli, staphylococcus aureus.)*

The previous study conducted by *Hossain et al.*, showed that the ethanol and acetone extracts of Emblica officinalis possess antibacterial activity. *Sahebetal.*, assed antibacterial activity tannins isolated from the leave and fruits of E.officinalis.

The previous study conducted by *Agnivesha* showed that phytoremediation is an emerging plant based technology for removal of toxic contaminants from water and soil. In that they showed that the ground water of the two districts in Kerala Palakkad and Alleppy had been reported that showed high fluoride content. They reported that plants like ramacham, tamarind seeds and clove were efficient in the removal of fluoride.

Flowers such as scared lotus (*Tamari nelumbium*or nelumbo nucifera) introduced in well, pond and in biowastes to cleanse all impurities in water and to remove bad odor. Our ancestors introduced the lotus in all well and ponds in villages where drinking water is drawn.

An Ayurveda classic had written water purification method for drinking purpose by some flowers such as Utpala (nelumbo nucifera), Naga (Mesura ferrea), Champaka (Michelia champaca) and Patala (Stereospermum suaveolens) among different communities this is stated as an accepted method for purifying water.y Sanskrit literature(2000BC) states that the foul water can be treated by boiling and dipping seven times a piece of hot copper into it and then filtering the water.

Plants such as Barringtonia acutangula, Neer marudhu and Doomar was planted near rivers, ponds, and water sources. They are capable of purifying water. Leaves of Ocimum have a capacity to remove *coliforms and Escheria coli.*

The study conducted by *Alexandra Sifferlin 2013.*reported that cilantro removes lead and nickel in water. It allows the water to trickle out but absorbs metals, leaving cleaner drinking water. Dried cilantro can also be placed in water for few minutes to suck out heavy metals. They says that a handful of cilantro will nearly cleanse a pitcher full of highly contaminated water.

Stephanie B. Velegolat Pennsylvania State University reported that Seeds such as Horseradish-tree, grape fruit extract, be coriander seed extract, and Moringa oleifera seeds forna functionalizeds and able to purify water from pathogens and bacteria such as *Escheria coli.*

Siddhuraju P, and Becker k reported that Moringa oleifera seeds as an antioxidant properties of various solvent extract of total phenolic constituents from three different agroclimatic origins of drumstick tree. These seed extract were used to purify the well water.

In this study among all 7 bacterial sp, fruit and leaves extract of *Emblica officinalis* produce maximum zone. Whereas the bacterial sp, *Salamonella para typhi A, Klebsiella Pneumoniae,* produce minimum zone in seed extract. And no zones were produced in other bacterial sp, such as *proteus vulgaris, E.coli, staphylococcus aureus* and *pseudomonas aeruginosa.*

6. Summary

In this study, is aim for our ancient, traditional methods of sustainable water purification was using *Emblica officinalis* (Indian gooseberry). The bore water from3 different area were collected and serial dilutions were performed and spread plate method were done in nutrient agar plate and the plates were incubated at 37°c for 24hr. Colony morphology were noted and different types of colonies were taken and inoculated in peptone water and kept incubation.

Gram staining, motility and biochemical test were performed and bacterial sp were identified. And some selective media were used to conform the pathogen. After the bacteria were isolated. The *Emblica officinalis* leaves, fruit and seeds were taken and washed with running tap water and rinsed with distilled water and dried in air. The fresh samples were oven dried at 60°c for 1hr continuously for7days.

The samples were dried and powdered using a clean blender. Then the powdered were stored in air sealed container at room temperature before extraction and 5gram of each extract were weighed and dissolved in 50ml of distilled water. Thereafter, it was filtered with the help of Whatman No.1 filter paper. The filtrate was collected and stored at 4°C for further use. The seven bacterial sp were as sayed by agar well diffusion method. Muller Hinton agar medium were poured in sterial petri plates aseptically and that were allowed to solidify. Well were made in the plates and lawn culture were done.

And the three extract were added in 100µl, 150µl and 200 µl concentrations. The plates were incubated at 37°C for 24hr without inverting the plate. Control well plates containing distilled water were also incubated. After incubation the results were recorded, as the presence of absence of inhibition zone. The zone around the well indicates positive result and the absence of zone indicates negative result.
The organism such as *Salamonella para typhi A, Klebsiella Pneumoniae,* produced minimum zone of inhibition in seed extract. And no zones of inhibition were produced in other bacterial species such as *proteus vulgaris, E.coli, staphylococcus aureus* and *pseudomonas aeruginosa.*

The fruit extract of *E.officinalis* produced maximum zone of inhibition in 200µl concentration. And minimum zone of inhibition were produced in 100µl and 150µl. The leave extract of *E.officinalis* produced maximum zone of inhibition in 100µl 150µl and 200µl concentration. The seeds of *E.officinalis* produced minimum zone of inhibition in 200µl concentration. And no zones of inhibition were produced in bacterial species such as *Staphylococcus aureus, Shigella flexneri.* Hence the organism is resistance to the *Emblica officinalis* seed extract.

7. Conclusion

In this study the aqueous extract was found to have high antibacterial activity against *Klebsiella Pneumoniae.* However the Emblica officinalis possessed antibacterial activity against all the test bacterial sp. The present study provides data for supporting the use of *Emblica officinalis*as natural broad spectrum antibacterial agents against wide range of microbes. And the present study disclosed the importance of traditional water purification technology to control pathogenic bacteria from bore water includes disinfection of water at affordable costs and methods using naturally available herbal leaves, fruit and seeds. This natural method of water purification is used to control pathogenic bacteria which pose threat to human health and can act as safe and effective method. The extract of *Emblica officinalis* has antibacterial activity gram negative bacteria. There was no activity against seed extract of *Emblica officinalis*is some organism such as *Shigella flexneri* and *Staphylococcus aureus*. However the activity shown against susceptible organism, as observed

in this study.

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