ANALYSIS OF WATER SAMPLE

An Industrial Training Report submitted

for the partial fulfillment of the Degree of Master of Science

By

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[M.Sc. (Microbiology), SemesterIV]

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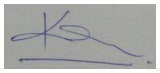
ANNEXURE 1

(On letterhead of the Industry)

C E R T I F I C A T E

This is to certify that this training report entitled “ANALYSIS OF WATER SAMPLE” was successfully carried out by Miss Hinal Kantibhai Bhimani towards the partial fulfillment of requirements for the degree of Master of Science in Microbiology of Shri M. & N. Virani Science College, Rajkot. It is an authentic record of her own work, carried out by her under the guidance of Mr. Kavan Kaneriya for a period of 1 February, 2021 to 30April,2021 during the academic year of 2019 – 2021.The content of this report, in full or in parts, has not been submitted for the award of any other degree or certificate in this or any other University.



Mr. Kavan Kaneriya

Name & Signature of the Head of the Department

Name & Signature of the supervisor

ANNEXURE 2

D E C L A R A T I O N

I hereby declare that the work incorporated in the present dissertation report entitled **"ANALYSIS OF WATER SAMPLE"** is my own work and is original. This work (in part or in full) has not been submitted to any University for the award of any Degree or a Diploma.

Ms. Hinal Kantibhai Bhimani

Date: 4 May, 2021

(Name and signature of Student)

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I am very much thankful to the Management of YOR LAB for providing me an opportunity and the facilities to carry out my internship work my post graduation.

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MS. HINAL KANTIBHAI BHIMANI

Date: 4 May, 2021

Place: Rajkot

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ABSTRACT

Name of institute: YOR LAB (NABL ACCREDITED LABORATORY). Topic is Analysis of Water Sample. There were maintaining good hygiene. This institute is ISI certified and it has Environmental GPCB consultancy. There were good instruments. Many methods used for analysis of environmental samples like water, soil, and also tested food samples, too. Water sample analysed by using different kind of methods like standard Plate Count (SPC) /Viable Plate Count , Different water sample has different numbers of colonies and, different sp. Of colonies. Coliform, microbial limit test (MLT) Turbidity test, pH test. Different water samples have different pH. Some water sample have acidic, some have alkaline pH.

INTRODUCTION

Name of institute – YOR LAB(NABL ACCREDITED LABORATORY). My topic is Analysis of water sample. This institute has a microbiology, physics and chemistry laboratory was available. This institute collects different samples of environmental elements, food samples, plastic testing has been done. Environmental sample like water sample analysis, soil sample, etc. Water sample microbiological testing. Soil sample testing and microbiological testing. Water sample mineral testing for the agricultural crops. Many different types of tests has been done like Microbial Limit Test (MLT), Standard Plate Count (SPC) / Viable Plate Count, Coliform testing, turbidity testing, pH, Most Probable Number (MPN test) water quality testing Different water sample has different pH like some have acidic and some have basic pH. Different water sample have different turbidity. some sample have more and some have less turbidity. Which kind of agricultural crops required which kind of minerals from water in basic requirement. This institute has a QA department, and QC department. And there were good instruments. It has ISI certified and Environment GPCB Consultancy.

MATERIALS AND METHODS

3.1) Standard Plate Count (SPC)

Materials:

- Water sample
- Nutrient agar media
- 70% Alcohol
- Distilled water
- Micropipete and tips
- Petriplate
- Flask
- Glass spreader

Method:

- In asceptic condition make serial dilution 10:1 to 10:7.
- Nutrient agar media was pour in petriplate.
- Wait for solidifying agar media.
- Add diluted water sample in each and every plate and labale according dilution.
- Incubate it at 37˚C for 24 hours.
- Note down the result.

3.2) Total Coliform Count (TCC)

Materials:

- Incubator
- Autoclave
- Colony counter
- Autopipete
- Distilled water
- Water bath
- Durham tube
- Petri plate
- Violet Red Bile Agar (VRBA)
- Brilliant Green Bile Broth (BGBB)
- Pepton salt

Method:

- Make water sample serial dilution up to 10:1 to 10:6 in pepton salt.
- Take sterile petriplate and laballed it.
- Add diluted water sample in petriplate and pour VRBA.
- Allow it to solidify
- Incubate it at 37˚C temperature for 24 hours.
- Next day colony counted and CFU calculated.
  Total Coliform = Number of colony * Dilution Factor
- Take BGBB and add Colony from the plate.
- Mix well
- Incubate tubes at 37˚C for 24 hours.
- Next day observe gas formation in durham tube.
- Gas bubble formation indicates the Coliform presence.
  (EMB media is also used)

3.3) Most Probable Number Test (MPN Test)

Materials:

- Test tubes
- Durham tubes
- Water sample
- Lactose broth
- Autopipete

Method:

- Take sterile test tubes, add lactose broth in all the tubes.
- In First five tubes add 10 ml of water sample.
- Then next five tube an inoculate by first group of test tube add 1 ml of inoculums.
- Then third group of test tubes were inoculated by second group of test sample inoculate 0.1 ml of inoculums.
- Incubate all the tubes for 24 hours at 37˚C.

3.4) Microbial Limit Test (MLT)

Materials:

- Petriplate
- Wire loop
- Tryptone soyabean broth (TSB)
- Macconkey broth
- Macconkey agar
- Eosin methylene blue agar (EMB)

Method:

- Take 10 ml of diluted sample in 90 ml of TSB.
- Incubate it at 30 – 35˚C for 24 hours.
- For detection of *E.coli* : Take 1 ml of inoculated TSB in 100 ml of Macconkey broth.
- Incubate it at 42` - 44˚C for 24 – 48 hours.
- Inoculate on Macconkey plate and EMB plate.
- For detection of *Pseudomonas aeruginosa* : used Cetrimide agar.

3.5) Turbidity of Water Sample

Materials:

- Glass beaker
- Filter paper
- Water sample; Stagnant water, well water, tape water

Methods:

- Take different water sample
- Purify water by filter paper, cut that part and put it on nutrient agar plate.
- Incubate it at 37˚c for 24 hours.
- Observe the colony.

3.6) pH of Water Sample

Material:

- Different water sample: Stagnant water, well water, tape water.
- Glass beaker
- pH strip
- pH meter

Method:

- Take different water sample indifferent glass beaker.
- Add pH strip in it.
- Measure the pH of water sample and note down the reading.
- Take water sample in pH meter and measure the pH.

RESULT

1) Standard Plate Count

- On nutrient agar plate off white color, small to medium colonies were found.
- 10;5 dilution is used for CFU calculation.
  CFU = $75*10^5$ CFU/ml

2) Total Coliform Count (TCC)

- Small colonies were found on VRBA media.
- Colonies were calculate, CFU Calculate
  CFU = 265 CFU/ml
- Inoculate colony in BGLB and gas formation is detected.
- It means the Coliform present in sample.

3) Most Probable Number Test (MPN Test)

- In first five test tubes were gave color change pale yellow.
- It gave positive result.
- Second five tube were gave some positive and some negative result.
- Third five group were gave negative result.
- No color changed.

4) Microbial Limit Test (MLT)

Sp.	Media	Result
E.coli	Macconkey agar	Non mucoidal pink colonies
E.coli	EMB agar	Green metallic sheen
Pseudomonas aeroginosa	Cetrimide	Florescent green colour

5) Turbidity

- Stagnant water sample filter paper gave more turbidity, and more colonies.
- Well water filter paper gave less colonies.
- Tape water gave less turbidity.

6) pH

- Stagnant water pH was acidic near 5.8 – 6.
- Well water pH was alkaline pH 7.9 – 8.3.
- Tape water pH was near about nutral 7.

CONCLUSION

From the above study concluded that the performing tests were give appropriate result and , know the how many kind of microorganisms were presented in water. Those were pathogenic and non pathogenic.

REFERENCE

- ISI lab manual of methods of analysis.