Lab : 1

Ways and means to collect water samples for the purpose of studies of microbiological

 Water makes up about 71% of the of the earth's surface, water is the middle of an environmental very large and diverse, So when you take water samples for the purposes of the studies microbiological must taking into consideration very important points as you must know some information about those waters such as the nature of these bodies of water (oceans, seas , rivers , lakes , ponds , Sewage and agricultural water etc.) and also find information about the depths to be studied and information on the chemical and physical properties and vital to those waters as knowledge dissolved oxygen content, temperature , the proportion of soluble salts and hydrogen ion concentration and water content of organic matter and the degree of turbidity.

Some points taking into consideration of water samples to be examination of microbial :

1. Must be taking the sample of the area to be studied in terms of location and depth, where the recorded observations about the combination being a site near a residential area or near factories or hospitals .

2. Must be use the correct statistical methods take into account in determining the many samples that are taken for the purpose of study,

3. Water samples are collected in a wide crater bottles with tight lid to avoid any kind of contamination.

 4. When taking the sample of tap water (drinking water) should be sterilized nozzle tap before taking the sample then leave to cool (This method is used for the purpose of drinking water test) However, if the purpose is to know Sources of pollution don’t sterilized bottle nozzle.

5. Water samples must be taken to reverse the trend and careful hands of contact the water sample or any other external thing.

6. Leave a space inside the bottles to allow creating aerobic conditions inside the bottle and at the same time allow the sample shake before testing them.

7. Some material may be added to the water sample, such as sodium sulfate to pull chlorine Cl that deadly microscopic organisms in the water, as well as the added material EDTA chelating substance is working to pull the iron from the water.

**Lab : 2**

Isolation and enumeration of water bacteria

Bacteria present in the water division into several groups :

1. Bacteria that live in nature and mostly located within gram negative bacteria and include many types belonging to the genera: - *Acinetobacter,* *Cytophaga, Flavobacterium, Pseudomonas,Chromobacterium*. And there are may gram positive bacteria a few such as *Micrococcus, Bacillus*.

2. Soil bacteria source and mostly follows the genus *Bacillus.*

3. Bacteria sourced from human and animal gut as a result of water pollution with human and animal waste such as *E. coli* coliform bacteria.

4. The bacteria can enter the water through the air or with rainwater such as *Streptomyces, Bacillus* .

There are many ways used to account bacteria in the water and the following is a review of some of them :

1. The total bacterial count in water

Plate count technique method

Materials and method :

1. Take water samples from various sources such as river water, tap water.

 2. Prepare dilution series 10-1, 10-2, 10-3 and 10-4 (work three replicates for each dilution).

3. Put 1ml from each dilution in a petri dish.

4. Pour the dissolved middle nutritious Casein Peptone Starch (CPS) at degree 45 C and mixed well with the dilution sample and placed and leave solidifies.

5.Incubate the first set of dishes at 25C degree for 14-7days , the second group incubate at degree 37C for two days.

6. After the expiration of the incubate count colonies in the dishes were a number of colonies between 300-30 colony.

7. Calculating the number of bacterial cells per 1ml of water following application:

 The number of cells in (1cm3) 1ml = number of colonies X inverted dilution .