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Determination of Viable Microbial Count Present in Tap Water

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Abstract:- The paper is mainly Research oriented work. In these work, microbiological arrangement is settled i.e. total aseptic conditions are done. Water is very essential matter in daily life and it is also a good solvent in our laboratory. The water is affected by different types of microbes like aerobic or anaerobic. The viable microbial count of particularly tap water is done in laboratory techniques, discussed in details. In normal days, there are serious matter for regular household life that if there are viable microbial count is high. That's why I am enhighlighting the matter.

Keywords:- *Viable microbial count, Tap Water, Miles & Misra Method, Colony Forming Unit, Results and Discussion.*

I. INTRODUCTION

In the study of microbiology, there are either estimate or determine the number of growths of bacterial cells in a broth culture or liquid medium. Determination of cell numbers can be accomplished by a number of direct or indirect methods. The methods include **standard plate counts (Viable Count)**, **turbidimetric measurements, visual comparison of turbidity with a known standard, direct microscopic counts, cell mass determination, and measurement of cellular activity, Miles & Misra Method**. In our study, there are different types of microbes like Viable (Movable) and non-viable (Not Movable). There is formation of microbes on the surface in form of **Colony**. The Unit of Microbial count is known as **Colony Forming Unit/ml [(CFU/ml)** in Liquid Product] and **Colony Forming Unit/mg [(CFU/mg)** in Solid Product. In normal days, there are serious matter for regular household life that if there are viable microbial count is high. That's why I am enhighlighting the matter.

Miles & Misra Method: The method of Miles & Misra (1938) has for many years been the standard technique for the determination of viable bacterial counts by surface inoculation of solid media. However, this method requires precision and skill if accurate results are to be obtained. One problem is the difficulty of preparing pipettes that accurately and consistently deliver 50 drops per ml. The method is also not without hazard to the operator. Johannson and Ferris (1946) have demonstrated aerosol formation when a liquid is dropped on to an agar surface, and the necessary agitation of dilutions during mixing also produces airborne bacteria. We describe and evaluate a procedure in which a semi-automatic pipette with glass capillary tubes is used. This method does not require the preparation and calibration of accurate dropping pipettes but has the accuracy of the Miles, Misra technique; it also has the advantages of being faster and of producing less bacterial contamination of the working surface.

II. METHOD

The serial dilution of the sample to be tested is prepared when using the method of Miles & Misra. The test-tubes & petridishes were marked as 1,2,3,4 as follows to 11, 12, 13, 14. The fresh inoculum is diluted to 1 in 10, 1 in 10^2, to 1 in 10^{14} by the following way. 0.5 ml of fresh original inoculum is taken out & mixed in 4.5ml of peptone water at tube no. 1. After mixing thoroughly, again 0.5 ml of peptone water is mixed from tube no. 1 to tube no. 2. In this way, all the test tubes, containing peptone water are serially six told diluted by ten times from previous one. The inoculum from each dilution is deposited as a drop onto the surface of a solid growth medium from a calibrated dropping pipette. Each 20microlitre drop (0.02ml) is allowed to fall from a height of 2.5 cm onto the surface of the well-dried growth medium, where it spreads over 1.5-2cm. each of six plates receives a single drop of each dilution tested. The cultures are then incubated to allow colonies to grow. Colony counts are made in the drop areas showing the largest number of discrete colonies that are not confluent following appropriate incubation.

The mean count from the three plates gives the viable count 20 microlitres of the dilution, & from this the viable microbial count in the original sample may calculated.

III. OBSERVATION

SERIAL NO.	DEGREE OF DILUTION FACTOR	NUMBER OF COLONIES
1	10^{14}	17
2	10^{14}	22
3	10^{14}	15

IV. CALCULATION

Now the average number of colonies are= [(17+22+15)/3]
= [54/3]
= 18

Number of drops in 1 ml = 20; Degree of dilution factor= 10^{14}

So, viable microbial count= [number of colonies × number of drops (in ml) × degree of dilution factor] cfu/ml
= [18 × 20 × 10^{14}] cfu/ml
= [360 × 10^{14}] cfu/ml
= **[36 × 10^{16}] cfu/ml**

V. REPORT

The number of bacterial colonies were found in the different dilutions are not similar. So, average number was taken. The viable microbial count was found to be **[36 × 10^{16}] cfu/ml** in tap water.

VI. DISCUSSION

In the Tap water, it would be common fact that there were much more viable microbes and microbial count would much more than normal Specification. So, in our regular day it may be conscious matter for household life, if there are highly viable count.

So, in my small work I have tried to enlighten the matter,

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