

Soil microorganisms

Soil microorganisms: Soil is an excellent culture media for the growth and development of various microorganisms. Soil is not an inert static material but a medium pulsating with life. Soil is now believed to be dynamic or living system.

Soil contains several distinct groups of microorganisms and amongst them bacteria, fungi, actinomycetes, algae, protozoa and viruses are the most important. But bacteria are more numerous than any other kinds of microorganisms. Microorganisms form a very small fraction of the soil mass and occupy a volume of less than one percent. In the upper layer of soil (top soil up to 10-30 cm depth i.e. Horizon A), the microbial population is very high which decreases with depth of soil. Each organisms or a group of organisms are responsible for a specific change / transformation in the soil. The final effect of various activities of microorganisms in the soil is to make the soil fit for the growth & development of higher plants . Living organisms present in the soil are grouped into two categories as follows

1. Soil flora (micro flora) e.g. Bacteria, fungi, Actinomycetes, Algae and

Soil fauna (micro fauna) animal like eg. Protozoa, Nematodes, earthworms, moles, ants, rodents .

Relative proportion / percentage of various soil microorganisms are: Bacteria-aerobic (70%), anaerobic (13 %), Actinomycetes (13%), Fungi /molds (03 %) and others (Algae Protozoa viruses) 0.2-0.8 %. Soil organisms play key role in the nutrient transformations .

factor effect of soil microbiology :

1. Moisture

2.ventilation

3. Light

4. Temperature A. Thermophiles B. Mesophiles 3. Psychropiles

5. PH

6. Organic mater

7. Mineral element

Procedure :

Soil sample collection

For bacterial isolation, 10 g of soil was collected from different area within pudukottai district. Soil sample were collected from upper layer of the farmland where maximum population of microorganism was concentrated. 5 g of soil sample was collected by using clean and dry sterile spatula in a clean polythene .

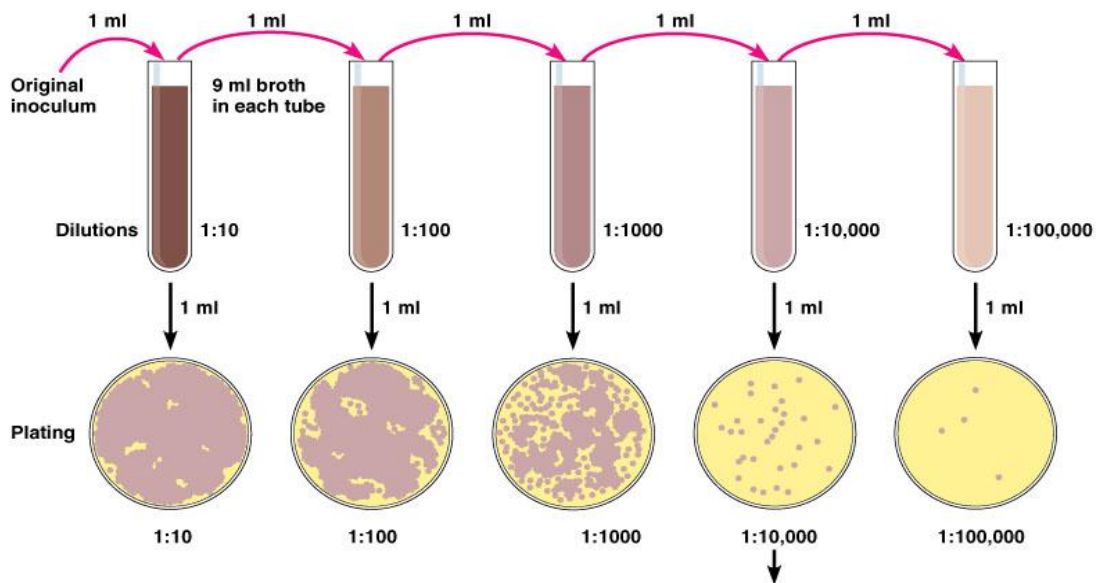
Culture media

Laboratory technicians inoculate the sample onto certain solid agar plates with the streak plate method or into liquid culture medium, depending what the objective of the isolation is :

If one wants to isolate only a particular group of bacteria, such as Group A Streptococcus cultured in blood agar to appear blood hemolysis , Mannitol salt agar favor survival of any staphylococci present in a sample , MacConkey agar for gram negative bacteria , and potato dextrose agar (DCA) and Sabouraud agar for isolation fungi and actinomyces .

Sample dilution :

Make serial dilution as follow :



Calculation: Number of colonies on plate \times reciprocal of dilution of sample = number of bacteria/ml
 (For example, if 32 colonies are on a plate of $1/10,000$ dilution, then the count is $32 \times 10,000 = 320,000/\text{ml}$ in sample.)

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1. Take 5 gm of soil from different area and make dilution .
2. Take suitable culture media and culturing in different methods form each dilution with labeling your sample.
3. incubation in 25C for 48 hr.
4. Read the result .