Environmental plate for growth of bacteria

Objective

In this exercise, you will be investigating bacterial growth (and perhaps some other microorganisms as well) from different environmental areas. Some of the suggested areas to be cultured will be found in this laboratory exercise. In subsequent laboratory exercises, you will be cultivating bacteria of particular types. Unwanted microorganisms which can get onto culture media and grow are called CONTAMINANTS. Care must be taken throughout subsequent laboratory exercises to avoid contamination. In this exercise, you will see the many places from which contamination can come as well as seeing where microorganisms can be found naturally.

The Petri dish you will be using contains a solid nutrient medium (food source) for growing bacteria. The bacteria will grow on this plate in the form of colonies. Colonies of bacteria are discrete circular areas which usually develop from a single cell. Each single cell grown into many cells can be viewed macroscopically (that is with the naked eye, rather than the microscope). Because each colony usually grows from a single cell, it represents a pure culture (culture of a single cell type).

Key terms

Agar: Polysaccharide that is used as solid matrix to support bacterial growth.
Colonies: a circular growth of genetically identical bacterial cells that originated from one single parental cell.

Materials

1 Trypticase soy agar plate
1 sterile swab
1 marker

Procedure: Day 1

1. Each of the six students per table are to perform **ANY ONE** of the following on their Petri dishes:
    a. Place your fingers on the Petri dish and rub them around on the surface. Do not press onto the agar.
    b. Take the lid off and leave a plate open to the air for entire lab period
    c. Swab the surface of your teeth and gums and then swab the surface of the plate
    d. Dip a sterile swab into the beaker containing soil and swab the surface of the plate.
    e. Using the sample of aquarium water in a beaker, dip a swab into it and then swab it on the surface of the agar plate

f. Dip a sterile swab in a tube of sterile water, then rub the desk top vigorously. Swab the surface of the plate with the swab

2. Each student should mark the **BOTTOM** of the petri plate with a marker, indicating your name and the type of specimen applied. Discard swabs in red biohazard bags.
3. Place the petri dishes upside down into the container designated by your instructor for incubation at appropriate temperature.

Day 2

1. Retrieve your incubated petri plate. Carefully take off the lid and observe the growth.
2. Record your observations below.
3. **SAVE YOUR SOIL PLATES FOR THE SPORE STAIN.**

Results

Type of specimen used _____

Relative amount of growth _____

(none, few colonies (1-50), moderate (50-100), or many (>100) colonies

Description of colonies: shape, size, color See diagrams on Exercise 2-2 of your manual

1.

2

3.

4.

Compare your plate with the plates of other students at your table:

1. Which type of specimen had the most colonies? _____
2. Which had the fewest? _____

Questions

1. Where are you likely to find bacteria and other microorganisms?

2. What is a colony?

3. Why would the number and type of colonies vary on plates from different sources?

4. What is considered a contamination?

5. Where do you think contamination can come from?

Examples of microbial colonies / growth on nutrient agar plates