Aseptic Transfer of Microbes: Sweep-Scale

Introduction

Microbes are present in and/or on all things in our environment unless those items are sterile. There are numerous bacteria on our skin, in our throats, in our noses and in our bowel; there are numerous fungi on our skin; there are a variety of microbes which are found on inanimate objects **(fomites)** as well as in dirt and on bugs.

Laboratories where students are taught about microbes are cleaner and safer than are our own homes. This is because of legislation such as DOT regulations, OSHA regulations and/or EPA requirements and due to oversight by institutional Environmental Health and Safety committees. It is also because stringent safety precautions must be observed and practiced on a daily basis in the lab. No one person is immune to those practices, i.e., every person must participate 100% in keeping the laboratory safe regardless of "position".

For the most part, our immune systems help protect us from the majority of pathogenic (disease-causing) microbes found in nature. There are times, however, when the fragile balance between health and disease, i.e., resistance and susceptibility to microorganisms, is shifted in favor of the microbes. When this balance is shifted in this manner, it is necessary to accomplish two tasks:

1) Identify the pathogen causing the disease and then treat it appropriately, and/or

2) Identify the source of the "beast" causing the problem and clean it up.

The objective of this experiment is to teach you, the student, exactly how to perform a very crude sweep of inhabitable areas were it necessary to study an outbreak of a communicable disease for its potential source or to determine the degree of contamination of a work surface or storage area of microbes, e.g., lab benches, refrigerators, incubators.

Materials and Methods

Materials

Sterile nutrient broth (1 tube)	Sterile cotton swabs (2 packages [4 swabs total])	4 agar plates -- to be assigned by instructor
1 indelible marker	Biohazard bag	Sterilizer
Incubator		Striker

Methods

Obtain the items in the table, above. Each person will be assigned a specific area of the building to swab. With your marking pen, label the agar plates with the site that you will swab. Go to each site and obtain your samples as follows:

Open a package of swabs and carefully remove the cotton plug (or screw- cap) from the tube of broth. Insert the sterile swab into the sterile broth and then wring the swab out on the wall of the tube.

Swab a region about 1" by 1" (2.54 cm X 2.54 cm) with your wet swab, then streak/smear it on the appropriately labeled agar plate.

Dispose of the swab in the biohazard bag.

Place the second sterile swab into the same tube of broth and wring it out, as well.

Swab the second region in the same manner as above and streak the swab on the second agar plate. Dispose of the second swab as above.

Repeat the process for the third swab and area and streak the swab on your third plate. Dispose of the swab as above.

For the fourth swab, repeat this process EXCEPT, after wringing it out, streak it right onto your 4^{th} agar plate and dispose of. This plate is your control plate.

Return the biohazard bag containing the swabs to the lab (they will be

sterilized for disposal) and place the streaked agar plates in the incubator at 37°C for 48 hours. At that time, in the provided space below, label and draw a quick sketch of all four (4) plates after the 48 hour incubation (use colored pencils to best illustrate your observations) as you observe the plates for the kind of bacterial growth, i.e., color of colonies, consistency of colonies:

Plate #1: _____	Plate #2: _____
Plate #3: _____	Plate #4: **CONTROL**

REFERENCES

1.Beishir, L.: **Microbiology in Practice: A Self-Instructional Laboratory Course, Fifth Edition**. (Harper Collins: New York) ©1991.

2.Thomas, C.G.A.: **Medical Microbiology, Sixth Edition**. (Bailliere Tindall: London) ©1988.