

EXPERIMENT 3

STERILIZATION AND MICROBIAL GROWTH CONTROL

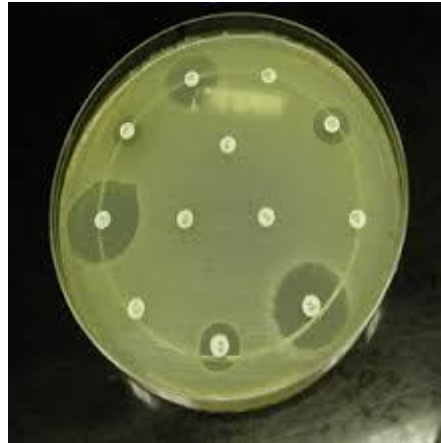


Figure 1: Microorganism growth inhibition by antibiotic (Source: <http://www.omafra.gov.on.ca/english/livestock/animalcare/amr/facts/13-077.htm>)

OBJECTIVES:

Student should be able to

1. To familiarize with the equipment and methods needed to prevent contamination
2. To conduct and explain the methods to control microbial growth.

MATERIAL

- Microorganism (s) - Escherichia coli culture in broth (one for each group)
- 50-mL 70% Ethanol (1 bikre each group)
- Dettol solution
- Ampicillin
- Penicillin G
- Sterile distilled water
- Sterile filter disk
- Agar in petri dish (4 for each group)
- L-shaped bent rod
- Pipettor
- Glass pipettes
- Empty small bottles (5 each group).

METHODOLOGY

1) Autoclave system handling

In this session, the lab technician will demonstrate how to use an autoclave for material and apparatus sterilization. Your task is to write a STANDARD OPERATING PROCEDURE for using autoclave. Make sure you have an endorsement of the written SOP before starting the rest of the lab session.

2) Antimicrobial effect analysis

You are given three types of solutions; ampicillin, penicillin G and Dettol.

- i) Dilute each solution to 10 x, 100 x and 1000 x dilutions.
- ii) In the meantime, spread 50 ml of E.coli solution/culture onto an agar plate.
- iii) Immerse one filter disk into the dilutions and strain excess of solutions before put on the surface of the agar containing E.coli.
- iv) Incubate for overnight and observe the microbial growth.
- v) Measure the inhibition zone for each dilution.

Caution: Put only two disks in one agar plate for convenient in observation.

3) UV light effect on microbial growth

- i) Expose one agar plate 30 minutes with the lid intact under a UV lamp (the technicians will help you with this).
- ii) Expose another plate without the lid and lay open to air and another agar plate intact with a box on the top of the lid.
- iii) Incubate them

4) Effectiveness of hand-soap

- i) Press one finger on the surface of an agar plate.
- ii) Then, wash your hands with hand-soap available in the laboratory.
- iii) Dry and press one finger on the surface of another agar plate.
- iv) Incubate them in 37 C overnight and observe if there is any microbial growth.

Reminder: All observation should be captured as images and attached them in your report.

QUESTIONS

1. Give one example of an antibacterial agent and give a brief description.
2. Read the label attached on any commercial antiseptic soap or hand-soap and list the chemical content. Point out the chemicals that are considered as antibacterial component.