



TESTING THE ANTIMICROBIAL PROPERTIES OF ESSENTIAL OILS

Name: _____

Date: _____

Experiment #: _____



OBJECTIVE: To investigate the ability of different essential oils to inhibit the growth of bacteria using a simple agar plate diffusion method.



MATERIALS:

- Agar plates with safe bacteria (*E. coli* or *Bacillus subtilis* from a science supply company)
- Essential oils (e.g., tea tree, lavender, lemon, peppermint)
- Sterile paper discs (or small circles of filter paper)
- Sterile tweezers
- Dropper or pipette
- Distilled water (control)
- Rubbing alcohol (70%)
- Permanent marker
- Ruler or calipers
- Zip-top bag or plastic wrap



PROCEDURE:

1. Wash your hands and clean your workspace with rubbing alcohol.
2. Label the bottom of the agar plate with the oil names and "Water" for the control.
3. Dip a sterile paper disc into an essential oil (use one disc per oil). Allow excess to drip off.
4. Place the disc gently onto the agar surface. Repeat for each oil. Add one disc with distilled water as the control.
5. Press each disc lightly to ensure good contact with the agar.
6. Seal the plate with plastic wrap or place in a zip-top bag.
7. Incubate the plate at room temperature in a warm, safe place for 24–48 hours.
8. Observe the plates. Measure the diameter of the clear zone (zone of inhibition) around each disc in millimeters (mm). Include the disc diameter in your measurement.



DATA TABLE:

Sample (Oil)	Disc Diameter (mm)	Zone of Inhibition Diameter (mm) (including disc)	Average (mm) (if repeated)	Observations
Tea Tree				
Lavender				
Lemon				
Peppermint				
Distilled Water (Control)				



REFLECTION QUESTIONS:

1. Which essential oil had the largest zone of inhibition?

2. Which had the smallest or no zone of inhibition?

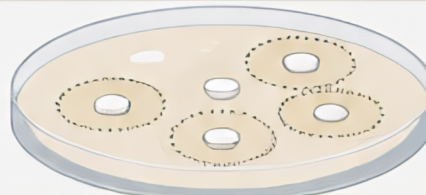
3. What do your results suggest about the antimicrobial properties of these essential oils?

4. What factors might affect the results of this experiment?



CONCLUSION:

Write a 2–4 sentence conclusion explaining what you learned from this experiment.



SAFETY FIRST:

Use only non-pathogenic bacteria plates from a science supplier.
Do not open the plate. Do not ingest anything. Wash hands after the experiment.