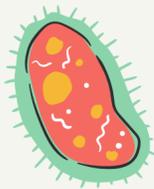


Do different substances affect bacterial growth?



Introduction

There has been a rise in concern regarding the spread of bacteria due to the COVID-19 pandemic. Fuelled by society's concern, there has been an increase of people who wish to protect themselves better from the spread of bacteria and practice better hygiene.

This experiment includes the testing of different substances and their growth of bacteria. The aim involves determining which substance had the best antibacterial properties that would protect it from the rapid growth of bacteria.

Aim

To test what different types of substances affect the growth of bacteria

Hypothesis

It is believed that antiseptic will most minimise the growth of bacteria due to antibacterial activity. Antiseptics are antimicrobial substances that are applied to living tissue or skin to reduce the possibility of infection, sepsis, or putrefaction.

What we tested

Five substances: dettol, hand sanitizer, tree oil, garlic oil and distilled water (control) soaked separately on filter paper in separate agar plates; to be observed over three and six days.

References: <https://www.stevespanglerscience.com/lab/experiments/growing-bacteria/>
<https://www.genome.gov/genetics-glossary/Bacteria>
<https://www.livestrong.com/article/166094-dettol-antiseptic-ingredients/>
 Data received 7 June and 10 June 2021 from in class experiment
 Poster made on Canva.com

Primary data table

Substance added to bacteria on agar plate	Observation % coverage of bacteria on plate	Class Average % cover	Observation - Inhibition zone (cm) - diameter across centre of test substance where bacteria don't grow	Class Average inhibition zone (cm)
Distilled water	82	74	0	0
Garlic oil	95	68	0	0.9
Tree oil	96	70	3	2.6
Hand sanitizer	60	33	1.1	1.4
Antiseptic	55	28	2.7	4.2

Observations

3 days after **DETTOL ANTISEPTIC** was added to the bacteria, an inhibition zone formed with a diameter of 2.7cm. The coverage percentage of bacteria on the agar plate was 55%. The inhibition zone was significantly bigger when compared to other groups in class.

HAND SANITISER had a bacteria coverage of 60% and had an 11cm long diameter in the inhibition zone after 3 days of observation. Compared to other groups, our inhibition zone was extremely small and it was not particularly distinct.

After three days, **TREE OIL** had the most coverage of bacteria with a percentage of 96% on the agar plate, an inhibition zone formed with a diameter of 8cm. Compared to other groups in the class, our inhibition zone was significantly smaller and had a bigger coverage of bacteria.

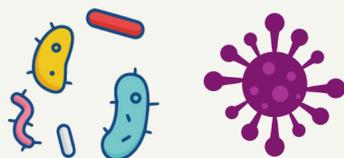
After 3 days, **GARLIC OIL** had no sign of an inhibition zone and a bacteria coverage of 95%. Compared to other groups in the class, our results were very similar, however, we had a bigger coverage of bacteria.

Discussion

This experiment showed that Dettol antiseptic would have the largest inhibition zone compared to the other substances which were tested; distilled water, garlic oil, tree oil and hand sanitizer. The antiseptic had the largest inhibition zone with a diameter of 2.7cm. This is the antiseptic having antibacterial properties, that stops the bacteria from continuing spreading and reproducing at a fast rate.

Conclusion

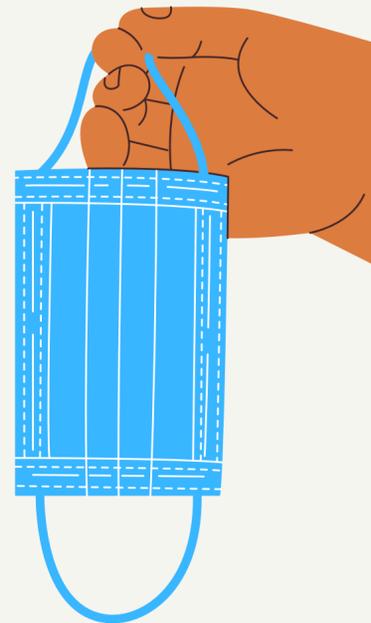
In conclusion, this experiment has tested what different types of substances affect the growth of bacteria and the growth of an inhibition zone. The results obtained through this experiment supports the hypothesis of antiseptic having the smallest inhibition zone due to it having the best antibacterial properties amongst the substances tested. The observations and data obtained from the experiment showed the effectiveness of each substance's antibacterial properties and the size of the inhibition zone. Garlic oil and distilled water showed no bacterial resistance due to their lack of chemicals that would act against bacteria.



Bacteria growth after 3 days

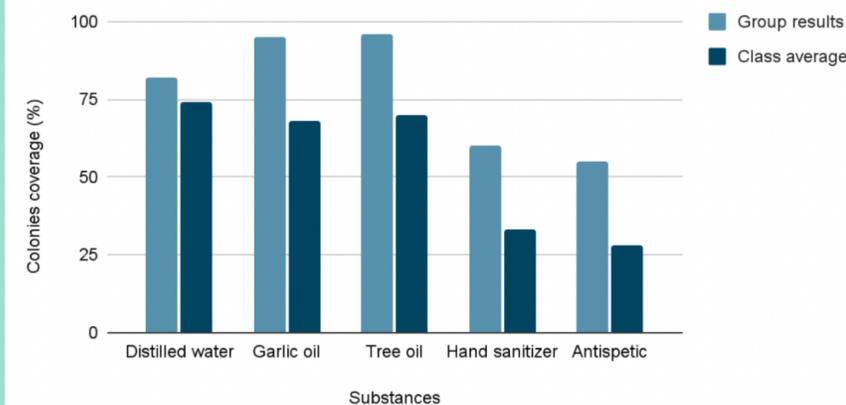


Bacteria growth after 6 days



Bacterial growth after 3 days for each substance

Figure 1: Number of colonies of bacteria over 3 days



Inhibition zone of bacterial growth after 3 days for each substance

Figure 2: Diameter of inhibition zone over 3 days

