

# Antibacterial Properties of *Aloe vera* and *Salvia rosmarinus*

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## Introduction

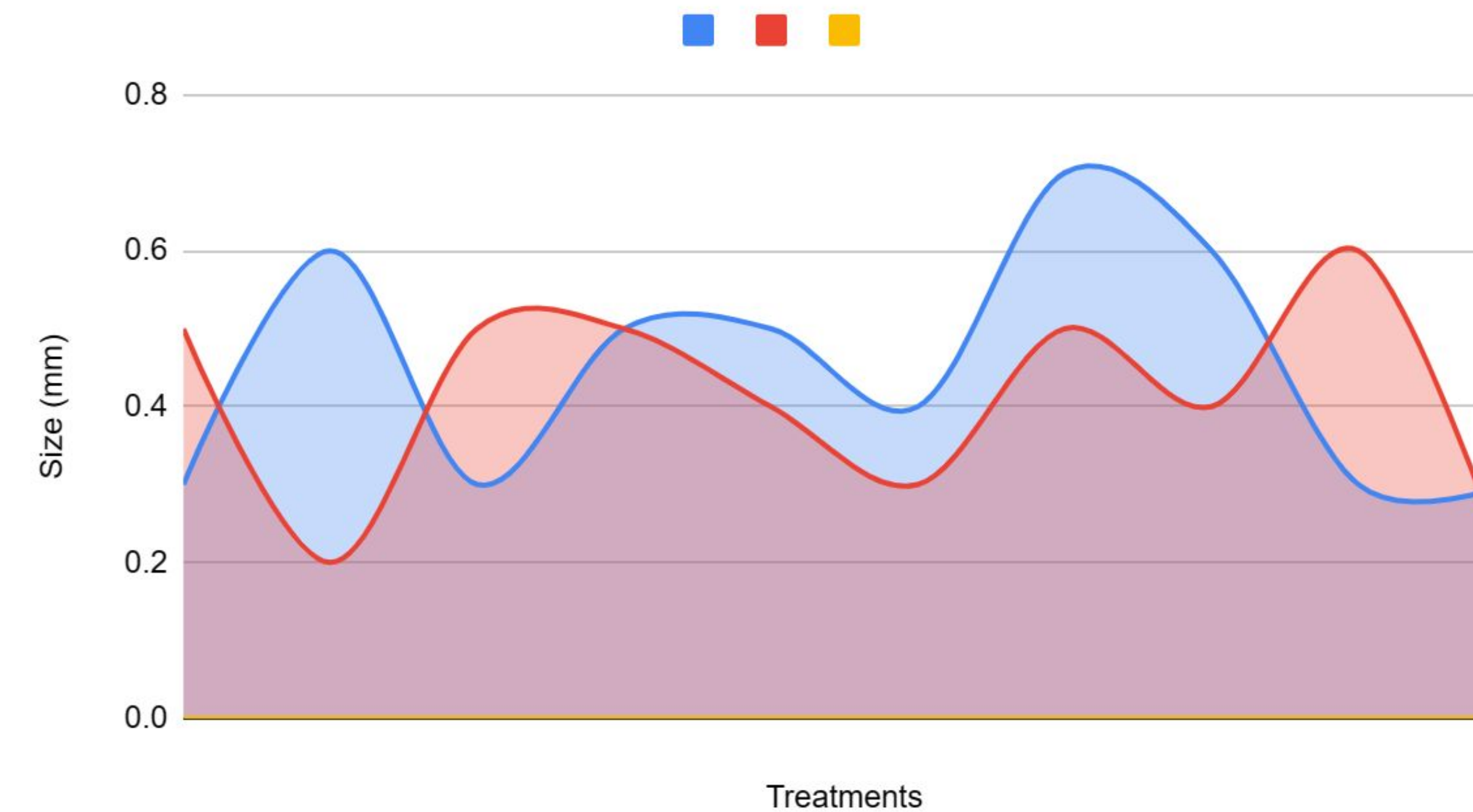
Antibacterial plants have are currently being used all over the world as a disinfecting agent. Especially since, “Antibacterial activity is found in 51 of 79 vascular plant orders throughout the phylogenetic tree” (Chassagne et al. 2021). The plants being used in this study have been proven to exhibit antibacterial properties for generations. The antibacterial properties of *Aloe vera* comes from ‘polyphenols’ and *Salvia rosmarinus* comes from ‘carnosic and rosmarinic acids’. These antibacterial properties are from different chemicals in each plant; thus, what is being tested is if these chemicals have differences in the effectiveness in preventing bacteria.

“Does *Aloe vera* have better antibacterial properties than the *Salvia rosmarinus*?” This experiment should include the hypothesis that *Aloe vera* plants will have larger rings in the bacteria than *Salvia rosmarinus* or that there is no antibacterial difference between the two plants.

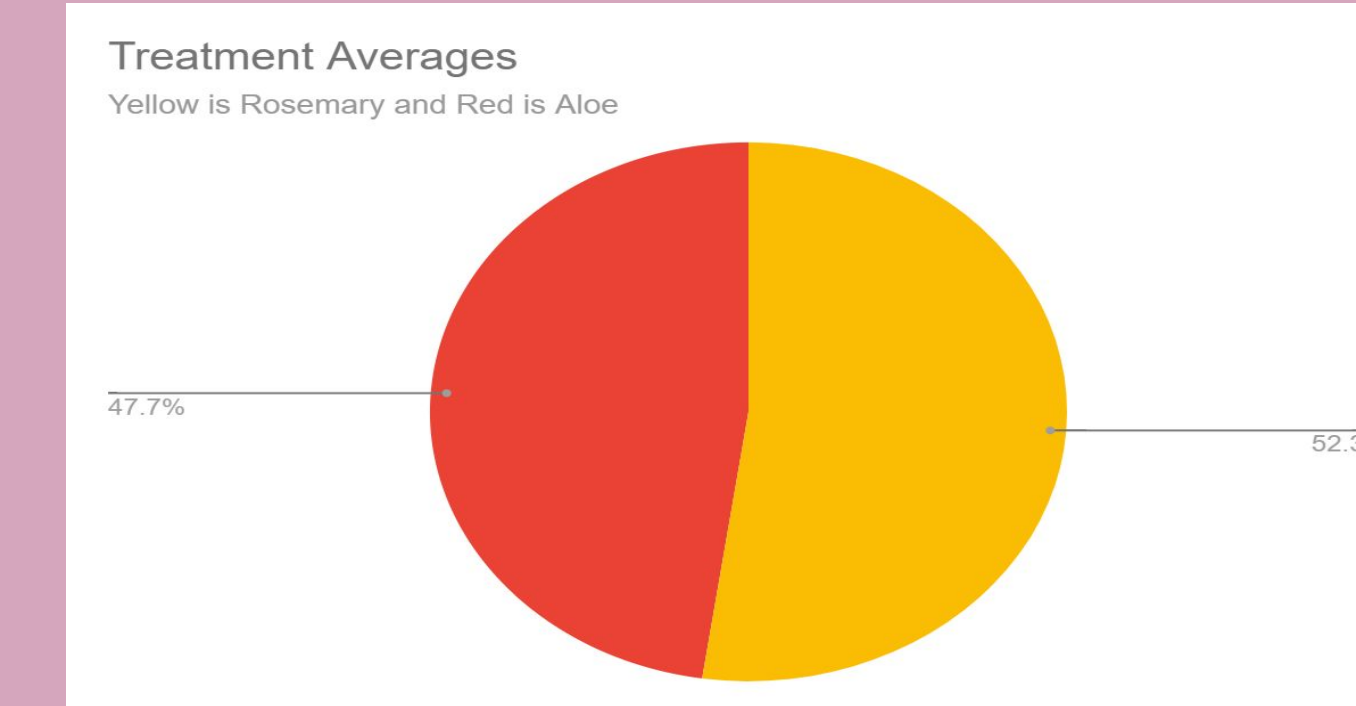
## Materials and Methods

To begin with, the *Aloe vera* and *Salvia rosmarinus* are picked fresh from outside. Then crushed into a paste with a mortar and pestle. A sensitivity disc is then dipped into the paste and transferred onto nutrient agar plates that are inoculated with *Bacillus thuringiensis*. To inoculate the plates, a pipette was used to transfer the bacteria and glass beads were used to evenly spread the bacteria. The glass beads were disposed of by placing them in a 10% bleach solution afterwards. Then the plates are to be put in an incubator at 21.3 degrees celsius for 24 to 48 hours. Following that, the plates were taken out and measured by a ruler. Measuring the circumference of the antibacterial ring around each sensitivity disc. With the measurements found, a p-value was calculated.

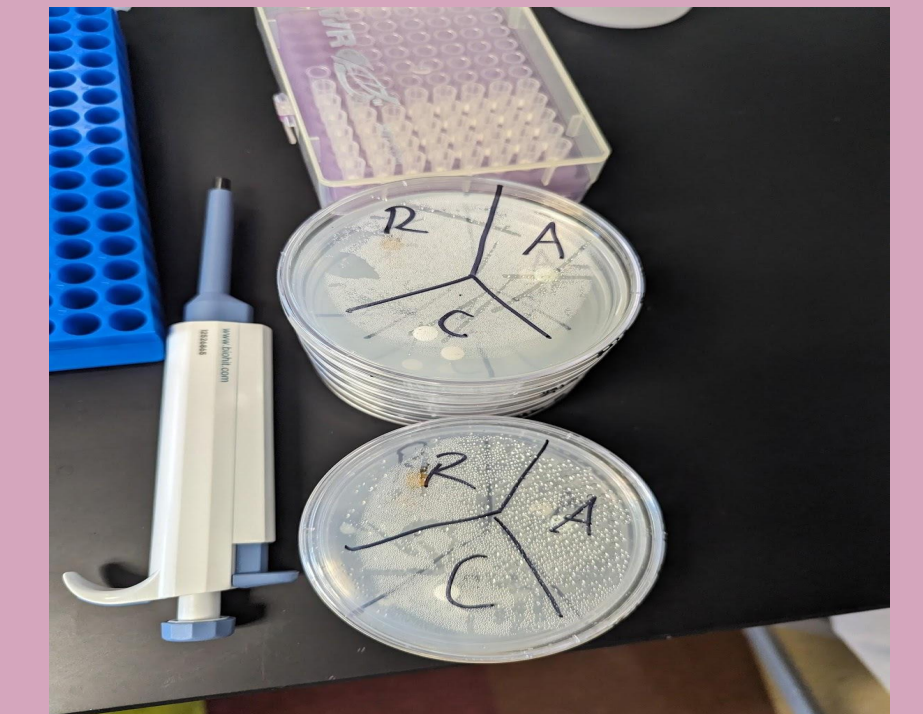
Antibacterial Ring Size



The T-Test is  $p = 0.27$ , indicating that there is no significant difference between the two plants antibacterial properties. However, compared the the control, they exhibit a positive strong relationship, showing that the do have antibacterial properties.



This diagram shows the relationship between the *Aloe vera* and *Salvia rosmarinus* antibacterial ring sizes.



This is the finished nutrition agar plates inoculated with bacteria.

## Conclusion

According to collected data, there is no significant difference in the antibacterial properties between *Aloe vera* and *Salvia rosmarinus* because the p-value can not support the hypothesis. Overall, there is a vaste difference between the use of these plants and the control groups results. This experiment concludes that there is no difference between the strength and potency of the antibacterial properties in *Aloe vera* and *Salvia rosmarinus*. Limitations in this experiment could come from the concentration of *Aloe vera* and *Salvia rosmarinus*, a concentrated oil could show different results.

Chassagne, F., Samarakoon, T., Porrás, G., Lyles, J. T., Dettweiler, M., Marquez, L., Salam, A. M., Shabih, S., Farrokhi, D. R., & Quave, C. L. (2021). A Systematic Review of Plants With Antibacterial Activities: A Taxonomic and Phylogenetic Perspective. *Frontiers in Pharmacology*, 11. <https://doi.org/10.3389/fphar.2020.586548>

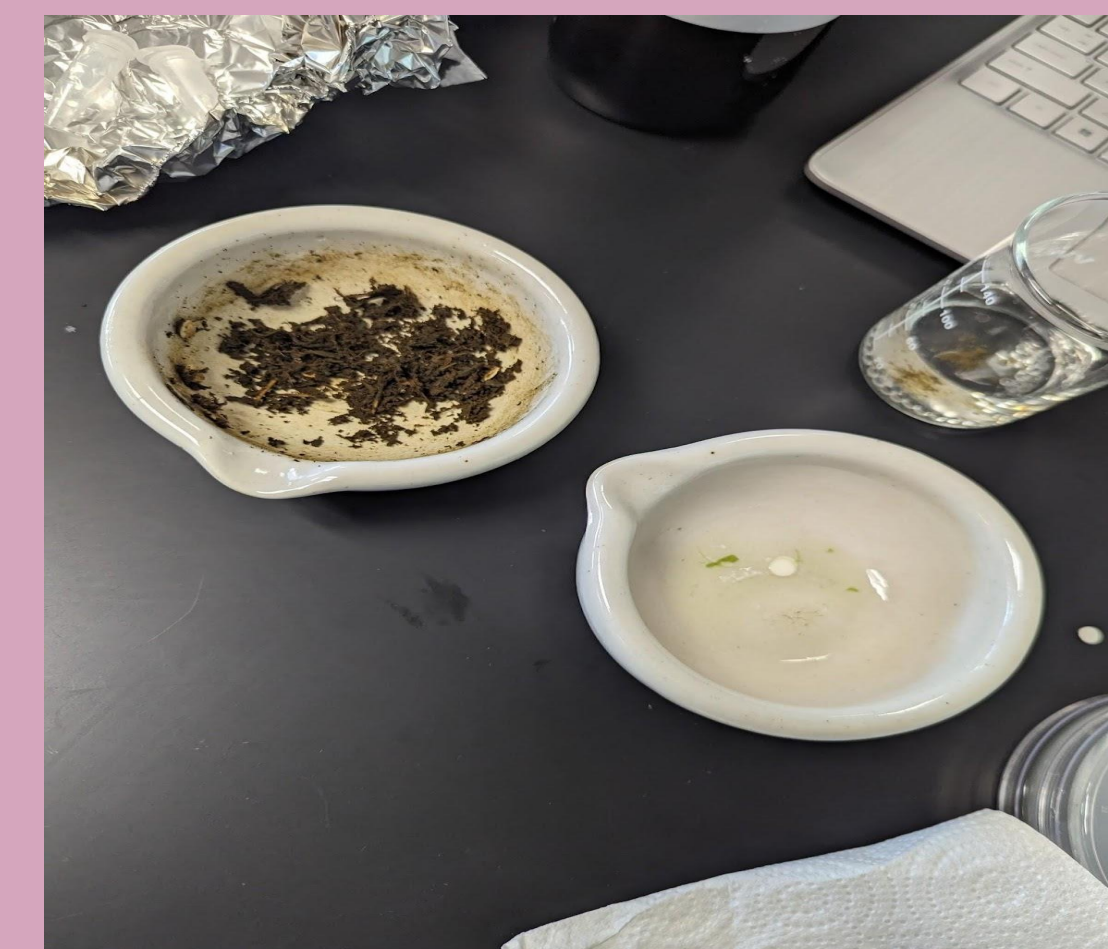
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Mortar and pestle. The left is *Salvia rosmarinus* and the right is *Aloe vera*.