

Effects of Cinnamon on *E-coli* and *Pseudomonas fluorescence*

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Historians have found ample anecdotes in ancient use of spices and herbs as preservatives and medicines [1]. Scientific experiments have been performed to test whether cinnamon powder can be used as a microbial growth inhibitor against certain strains of E-coli. Those tests ended up with positive and industry changing results. [2] By using additional experimental techniques unlike those used in previous research to not only test the effect of cinnamon on E-coli, but also *Pseudomonas fluorescence*, an improved and natural preservative could be found.

To test the hypothesis that cinnamon will in fact inhibit bacteria growth, triplets of 0%-80% cinnamon concentrations (in 10% increments) were made. The diluted solutions were then incorporated in a mixture including low-salt LB and a set amount of E-coli/*P. fluorescence*. Our results showed slight correlation with the increase of cinnamon concentration and the decrease of *Pseudomonas fluorescence* growth. E-coli however, had unclear evidence of bacteria death by cinnamon.

Stage two experiments were meant to go into greater detail with cinnamon's effects. This stage was composed of triplet T-streaked low salt agar plates made of 0%-5% cinnamon concentration. The results proved positive for growth inhibition for both types of bacteria indicated in Figure 1.

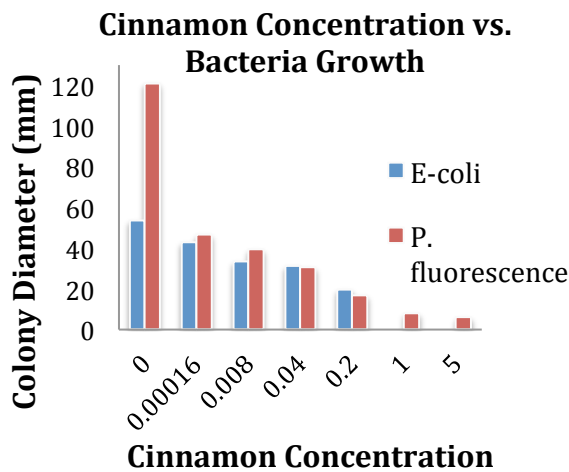


Figure 1: The histogram above depicts the direct and more accurate correlation between increasing cinnamon concentrations and decreasing bacteria growth.

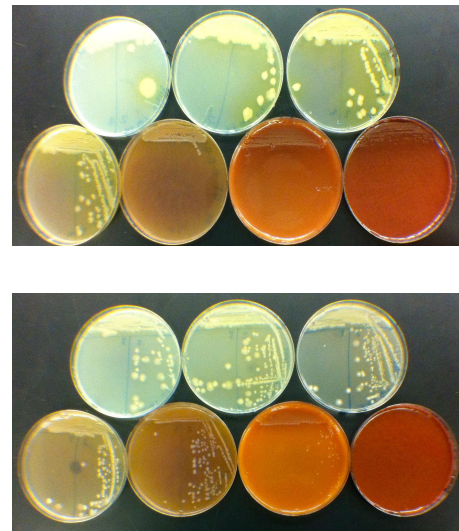


Figure 2:
Top: *P. fleur* colony death progression.
Bottom: E-coli colony death progression

Cinnamon has shown to be an effective bacteria-killing agent with E-coli in previous experiments. Through the extensive testing depicted above, a confirmation was maintained that cinnamon also affects the growth rate of *Pseudomonas fluorescence*. These repetitive results may hold a future in the preservation industry however, future direction with this research could include the testing of other related bacteria along with various cinnamon mixtures.

References:

- [1] McCormickscienceinstitute.com. 2013. *McCormick Science Institute - History of Spices*. [online]. Available at: <http://www.mccormickscienceinstitute.com/Spice-Landing/History-of-Spices.aspx> [Accessed: 21 Nov 2013].
- [2] Ceylan, E. (2003). *Antimicrobial Activity of Spices Against Escherichia Coli O157:H7 and their Application in Solid and Liquid Foods*. [online]. Available: <http://202.28.199.34/multim/3113937.pdf>. [Accessed: 21 Nov 2013]