

Antibacterial Effects of Culinary Spices on *Serratia marcescens* and *Bacillus cereus*

Seid, Lisa (School: The Mississippi School for Mathematics and Science)

According to the World Health Organization, there are 600 million cases of food borne diseases and 420,000 deaths each year. This disparity can be especially harmful and prevalent in developing countries with poor sanitation and food handling. Current antibacterial agents used to preserve and keep food viable are limited in their ability to resist bacterial toxicity. However, many cultures do include spices in their preparation and cooking. Spices are a natural bioingredient that would eliminate the side effects and concerns from using synthetic chemical compounds. The objective of this study is to investigate antibacterial potential of four common household spices – cinnamon, clove, oregano, and thyme – to prevent or reduce the effect of food borne pathogens. The quality of inhibition was tested on bacteria samples of *Serratia marcescens* and *Bacillus cereus*, a gram-negative and gram-positive bacterium respectively. Blank discs soaked in essential oil extracts of these spices were placed on each culture of bacteria, and the results were measured by the growth of the zone of inhibition. Oregano had the largest radius measured from the zone of inhibition indicating that it has the greatest antibacterial effect, and thyme had the smallest zone of inhibition indicating that it has the least antibacterial effect, meaning the bacteria culture still manages to thrive in the presence of the spice. Based on these results, both null hypotheses were rejected, and the alternates were accepted.