The Effect of Phenols in Ginger, Garlic, and Cinnamon on Escherichia coli and Bacillus cereus

Zhao, Angela
Jani, Himani
Zhao, Angela

For centuries, spices have become popular in different cultures due to their medicinal values and antimicrobial properties. Spices have been shown to have a high phenolic content, which may contribute to their antimicrobial abilities. This study was conducted to investigate the effect of phenolic content in ginger, garlic, and cinnamon on bacterial cells. The antimicrobial activity of these spices were measured against Escherichia coli, a Gram-negative bacterial species, and Bacillus cereus, a Gram-positive bacterial species. A methanol-based extraction was performed as well; methanol was a prefered method because of its ability to bring out the phenols in the spices. Antimicrobial activity was screened by a disc diffusion method and then the zones of inhibition were measured. Overall, the methanol-based extraction gave better results, and cinnamon, the spice with the highest phenolic content, inhibited the most bacterial growth. Moreover, the spices inhibited more growth of B.cereus than E.coli. Thus, the results conclude that the amount of phenols in spices has a direct correlation to their antimicrobial properties; they are effective antimicrobial agents to combat Gram positive and Gram negative bacteria. Eating foods high in phenolic content could promote better health in the long run and decrease one's risk of developing cardiovascular diseases and cancer. Furthermore, integrating phenols into drugs/medicine could enhance the biotechnology and medical field, improving future therapies for diseases.

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