Investigating an Alternative Treatment Protocol for Commonly Occurring Pathogenic Bacteria: Escherichia coli, Methicillin-Resistant Staphylococcus aureus, and Listeria monocytogenes

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The purpose of this project was to find an alternative method protocol to treat infections caused by the following pathogens: Escherichia coli, Methicillin-resistant Staphylococcus aureus, and Listeria monocytogenes, by using an antimicrobial which was both cost-effective to produce and work as effectively to kill the pathogenic bacteria as the antibiotics administered to treat diseases caused by these pathogens. This research could benefit those who are financially unstable and reduce the prevalence of antibiotic resistance and the loss of mutualistic gut bacteria caused by antibiotics. The hypothesis stated that the phytoalexin from the Canna indica plant – tested to determine if any antimicrobial properties were present – would kill the bacteria in question as effectively as the conventional antibiotics, and that the lactic acid probiotics which are most present in the gastrointestinal tract would kill the bacteria more effectively than the plant's phytoalexin and as effectively as the antibiotics. The method used was to grow cultures of the different pathogenic bacteria in fresh broth and adding the cell-free supernatant inoculum from the plant and probiotics respectfully. The bacterial plates were monitored over a suitable incubation period. The disk diffusion method was used to determine results. The results adequately supported the hypothesis. The plant phytoalexin was able to kill and hinder the growth of the bacteria effectively, the compound 3,15-dihydroxy-2-octadecene has antimicrobial properties; however the probiotics possessed stronger antimicrobial properties and killed the bacteria as effectively as the phytoalexin. The adapted probiotics in particular killed the bacteria as effectively as the generic antibiotics.

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