The Antibacterial Effect of Allium sativum on Gram-Positive and Gram-Negative Bacteria Phase II

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In 2019, bacterial infections were estimated to be the second leading cause of death worldwide, responsible for every one in eight global deaths. More than half of these were caused by bacteria such as Streptococcus Pneumonia, E.Coli, Pseudomonas aeruginosa, and Staphylococcus aureus. Although antibiotics are effective against these infections, inadequate access, resistant strains, and differing immune systems cause challenges. To combat this global health issue, I expanded my Phase 1 investigation on the antibacterial properties of Allium Sativum (garlic) by observing its inhibitory properties against ten different strains of gram-positive and negative bacteria, as well as its strength when combined with various kinds of honey. Garlic was tested in extract and pure Allicin form, and in combination with honey from Iowa, India, and New Zealand (Manuka). The experimental results showed that a combination of garlic extract and Manuka honey was the most effective against strains of Pseudomonas, E.Coli, and Staph aureus. The inhibition zones of this garlic extract and Manuka honey mixture were comparable to typical inhibition zones displayed by regular antibiotic treatments for these bacteria. These results indicate that garlic and honey can be used as alternatives to antibiotics for certain respiratory bacterial infections which would be life-changing for those who are immuno-compromised, allergic, do not have access to antibiotics, or can not afford them. To make this effective treatment more accessible, I developed both a candy and a pill formulation from garlic extract and Manuka honey. This dual-delivery approach offers a tangible solution for individuals struggling with respiratory bacterial infections, providing a convenient and affordable alternative to antibiotics.

Awards Won:

Drug, Chemical &amp

Associated Technologies Association (DCAT): DCAT First Prize