Returning to Roots: A Study on the Antibacterial Properties of Herbal Extracts Found in Traditional Chinese Medicine

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Antibiotic resistance has been named as one of the greatest threats the modern public health system faces. One method of tackling growing antibiotic resistance is to explore substances overlooked with the advent of antibiotics. This project sought to determine the presence, if any, of antimicrobial properties from plant extracts utilized in traditional chinese medicine through EUCAST and EUSCMID broth dilution methods. Specifically, M. Smegmatis was used as a model organism due to the natural antibiotic resistance found in mycobacterium and their unique cell wall structure that contains mycolic acid. The herbs tested were all traditional chinese medical (TCM) herbs with acclaimed benefits against inflammation and open wounds that have yet to be confirmed through scientific methods. Through the broth dilution method, seperate dilutions were made at 16.7%, 33.3%, 50.0%, 67.7% and 83.3% in order to determine the MIC value. In comparison to a positive growth control it was determined that boiled peony bark and rehmannia root tea both contained active ingredients that inhibited mycobacterial growth. In both instances a biofilm was observed that is a characteristic self-defense mechanism of mycobacterea when surrounded by a hostile environment. However, peony bark extract was also observed to disrupt the biofilm and in many instances prevent its formation altogether. The third herb, coptis chinensis did not inhibit bacterial growth. Thus, this study not only demonstrates two possible sources for active ingredients that can be utilized against bacteria derived from TCM, but also confirms the necessity of further scientific investigation into claims made by TCM practitioners.

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