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Abstract

Poster

Major Biology

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Antimicrobial Activity of Plant Extracts

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Today's society heavily relies on the use of antibiotics to cure bacterial infections. Bacterial resistance occurs when a given bacteria is no longer able to be effectively treated by a particular antibiotic due to the bacteria's ability to become immune to the antibiotic. This experiment examined the antimicrobial properties of various plant extracts such as cinnamon oil, clove oil, cannabidiol oil, tea tree oil, and others. Medicinal drugs are often originally purified from plant products (e.g. aspirin from willow bark, Taxol from the bark of yew trees for breast cancer treatment). Some of these plant products exhibit antibacterial activities. Natural extracts are often effective due to the action of several plant components acting synergistically. The goal of this experiment was to test the plant extracts against several potentially pathogenic bacteria (three Gram-positive species and one Gram-negative species) and two fungi. The level of growth reduction of the bacteria and yeast compared to general antibiotics, antifungals, and controls were observed. The amount of bacteria growth was used as an indicator of the effectiveness of the extract. Expression of several bacterial genes was examined using real time quantitative polymerase chain reaction (qPCR). Gene expression was different in bacteria exposed to cinnamon oil or streptomycin antibiotic compared to the control. This research contributes to the understanding of antimicrobial properties of plant extracts and effects of the metabolic pathway of the treated bacteria.