Interactions of Bactericidal Essential Oils

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The purpose of this study was to discover the most effective bactericidal essential oils, especially in combination, on Gram-positive and Gram-negative bacteria. BSL-1 microorganisms Escherichia coli B and Bacillus cereus were plated on TSA in the presence of small filter paper circles treated with the individual essential oils grapefruit, lavender, and tea tree. Combinations of these oils in 1:1 ratios were also tested. It was hypothesized that if combinations of essential oils have synergistic effects, then areas of inhibition around filter paper disks soaked in the combinations would be larger than those around disks soaked in a single essential oil. It was found that individually, tea tree was the most effective bactericidal oil with lavender ranking second and grapefruit third. Only the combination of grapefruit and lavender demonstrated synergistic effects. All of the oils were more effectively bactericidal when used with the Gram-positive Bacillus cereus than the Gram-negative Escherichia coli B. This was expected because of the additional membrane that surrounds Gram-negative bacteria.

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