Antimicrobial-Guided Metabolomic Analysis of Essential Oil Derived from the Aotearoa New Zealand Endemic Plant Kunzea robusta (Kānuka)

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Project Description:

Traditional medicine has been the source of many modern drugs. To explore the pharmaceutical potential of extracts from a taonga (treasured Indigenous plant) species, we obtained an unbiased GC–MS profile of 84 compounds from 99 samples of kānuka oil collected from five land blocks across two seasons. Multivariate analysis correlated the compound profiles with antifungal, antibacterial, and anti-acne activities as determined via growth inhibition of Candida albicans, methicillin-resistant Staphylococcus aureus (MRSA), and Propionibacterium acnes, respectively. The kānuka oil samples had the greatest activity against P. acnes. Samples collected during spring were more associated with antifungal activity, while samples collected during autumn were more associated with anti-MRSA and anti-acne activities. While α -pinene was the most abundant compound, partial least squares regression analysis identified other lead compounds for antifungal activity (α -muurolene, isoamyl isovalerate, and 4-carene) as well as a common set of lead compounds for anti-MRSA and anti-acne activity that included limonene and nerolidol. An unidentified compound was particularly interesting as it was the only compound to positively correlate to all three bioactivities. The results from this study provide molecular insight into specific compounds in kānuka oil that can be further explored for pharmaceutical and cosmeceutical potential.

Project Notices



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