Uji Aktivitas Antitirosinase, Antielastase, dan Antibakteri Penyebab Jerawat dari Minyak Atsiri Kulit Buah Citrus amblycarpa Ochse Menggunakan Metode Microwave-Assisted Hydro-Distillation = Antityrosinase, Antielastase, and Antibacterial Activity Testing of Acne-Causing Agents from Essential Oil of Citrus amblycarpa Ochse Peel Obtained Using Microwave-Assisted Hydro-Distillation Method

Marlisa Sintikhe Kaleb, author

Abstrak

Jeruk limau merupakan bahan alam dengan beragam manfaat, namun penelitian mengenai pemanfaatannya masih terbatas. Penelitian ini bertujuan untuk menguji potensi minyak atsiri kulit jeruk limau dalam aktivitas antitirosinase, antielastase, dan antibakteri penyebab jerawat. Metode ekstraksi minyak atsiri menggunakan metode Microwave-Assisted Hydro-Distillation (MAHD), sedangkan analisis senyawa kimia dilakukan dengan GC-MS. Pada uji antitirosinase, asam kojat memiliki IC50 sebesar 4,96 µg/mL, sedangkan minyak atsiri kulit jeruk limau memiliki IC50 sebesar 251,36 µg/mL. Pada uji antielastase, kuersetin sebagai pembanding memiliki nilai IC50 24,1 µg/mL, sementara minyak atsiri kulit jeruk limau memiliki IC50 sebesar 46,56 µg/mL. Uji aktivitas antibakteri terhadap bakteri P. acnes menunjukkan zona hambat sebesar 13,04-16,05 mm, sedangkan pada S. aureus menunjukkan zona hambat 15,06-22,16 mm yang berpotensi kuat dalam menghambat bakteri penyebab jerawat. Hasil analisis GC-MS menunjukkan keberadaan senyawa aktif seperti sitronelol, d-limonena, sitronelal, -pinena, dan -terpeniol dalam minyak atsiri. Senyawa-senyawa tersebut memiliki potensi aktivitas biologis terkait penghambatan tirosinase, elastase, dan bakteri penyebab jerawat. Penemuan ini dapat memberikan kontribusi pada pengembangan produk perawatan kulit yang berbasis bahan alam.

.....Lime is a natural ingredient with various benefits, but research on its utilization is still limited. This study aims to examine the potential of lime peel essential oil in anti-tyrosinase, anti-elastase, and antibacterial activities against acne-causing agents. The essential oil extraction method used Microwave-Assisted Hydro-Distillation (MAHD), and the chemical compound analysis was conducted using GC-MS. In the anti-tyrosinase test, kojic acid had an IC50 of 4.96 µg/mL, while lime peel essential oil demonstrated an IC50 of 251.36 µg/mL. In the anti-elastase test, quercetin as a comparator had an IC50 value of 24.1 µg/mL, where as lime peel essential oil showed an IC50 of 46.56 µg/mL. Antibacterial activity against P. acnes showed inhibition zones ranging from 13.04-16.05 mm, indicating strong potential, while S. aureus exhibited inhibition zones of 15.06-22.16 mm, suggesting strong potential in inhibiting acne-causing bacteria. GC-MS analysis indicated the presence of active compounds such as citronellol, d-limonene, citronellal, -pinene, and -terpineol in the essential oil. These compounds demonstrated potential biological activities related to the inhibition of tyrosinase, elastase, and acne-causing bacteria. These findings could contribute to the development of natural-based skincare products.