

Uji Penghambatan Aktivitas Tirosinase dan Elastase serta Karakterisasi Minyak Atsiri Kulit Jeruk Limau (*Citrus amblycarpa*) = Tyrosinase and Elastase Activity Inhibition Assay and Characterization of Citrus Peel Essential Oil (*Citrus amblycarpa*)

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Abstrak

Jeruk limau adalah salah satu sumber minyak atsiri yang dapat dijumpai secara mudah di Indonesia, tetapi belum banyak penelitian yang menguji manfaatnya. Penelitian ini bertujuan untuk menguji potensi minyak atsiri kulit jeruk limau dalam menghambat aktivitas enzim tirosinase dan elastase, serta melakukan karakterisasi menggunakan pengukuran massa jenis, indeks refraksi, putaran optik, dan analisis GC-MS. Metode ekstraksi minyak atsiri dilakukan menggunakan distilasi air, kemudian pengujian antitirosinase dan antielastase dilakukan dengan mengukur absorbansi minyak atsiri dalam menghambat enzim menggunakan microplate reader. Asam kojat sebagai pembanding uji antitirosinase memiliki IC₅₀ sebesar 4,26 g/mL, sedangkan minyak atsiri kulit jeruk limau memiliki IC₅₀ sebesar 235,89 g/mL. Pada pengujian antielastase, pembanding kuersetin menunjukkan IC₅₀ 6,12 µg/mL terhadap enzim elastase, sedangkan minyak atsiri kulit jeruk limau memiliki IC₅₀ sebesar 40,66 g/mL. Nilai massa jenis minyak atsiri kulit jeruk limau sebesar 0,8317 g/mL, indeks refraksi sebesar 1,467, dan perputaran optik sebesar $[\alpha]_{25} = +35,10$ (c=1, neat, =589 nm) yang memberikan informasi awal mengenai kebenaran minyak atsiri yang diteliti. Hasil analisis GC-MS menunjukkan adanya senyawa aktif dalam minyak atsiri, yaitu -pinena, d-limonena, sitronelal, sitronelol, dan -pinena. Oleh karena itu, penelitian ini menunjukkan kebenaran minyak atisiri kulit jeruk limau dan potensinya sebagai ihibitor tirosinase dan elastase.

.....One such source of essential oil is *Citrus amblycarpa*, commonly known as kaffir lime, which is readily available in Indonesia, but there have been limited studies exploring its potential applications. This research aims to investigate the inhibitory potential of kaffir lime peel essential oil against tyrosinase and elastase enzymes, while also characterizing its physical and chemical properties through density, refractive index, optical rotation, and GC-MS analysis. The essential oil was extracted using water distillation, and its anti-tyrosinase and anti-elastase activities were evaluated by measuring its absorbance using a microplate reader. The positive control, kojic acid, exhibited an IC₅₀ value of 4.26 g/mL in the anti-tyrosinase assay, while the kaffir lime peel essential oil sample showed an IC₅₀ value of 235.89 g/mL. In the anti-elastase assay, the positive control, quercetin, displayed an IC₅₀ value of 6.12 µg/mL, while the kaffir lime peel essential oil sample demonstrated an IC₅₀ value of 40.66 g/mL. The measured density of kaffir lime peel essential oil was 0.8317 g/mL, with a refractive index of 1.467 and an optical rotation of $[\alpha]_{25} = +35.10$ (c = 1, neat, = 589 nm). GC-MS analysis identified several active compounds in the essential oil, including -pinene, d-limonene, citronellal, citronellol, and -pinene.