Analisis Fitokimia, Aktivitas Antioksidan, dan Sitotoksisitas Ekstrak Daun Jeruk Purut (Citrus hystrix DC) terhadap Sel Kanker Hati HepG2 = Phytochemical Analysis, Antioxidant Activity, and Cytotoxicity of Kaffir Lime Leaf Extract (Citrus hystrix DC) on HepG2 Liver Cancer Cells

Tambun, Chelsea Tabitha Arthauly, author

Abstrak

Latar Belakang: Kanker hati merupakan kanker dengan tingkat prevalensi yang tinggi baik secara global maupun nasional. Kanker hati juga menempati peringkat kelima tertinggi penyebab mortalitas di Indonesia. Tatalaksana kanker hati seperti pembedahan, transplantasi hati, ablasi termal, dan kemoterapi memiliki banyak efek samping dan memerlukan biaya yang mahal. Penelitian ini bertujuan untuk mengetahui potensi daun jeruk purut (Citrus hystrix DC) sebagai antioksidan dan agen sitotoksik terhadap sel kanker hati HepG2. Metode: Maserasi dan ekstraksi daun jeruk purut dilakukan menggunakan pelarut polar (etanol), semipolar (etil asetat), dan non polar (n-heksana). Uji fitokimia dan kromatografi lapis tipis (KLT) dilakukan untuk mengetahui kandungan fitokimia ekstrak daun jeruk purut. Uji aktivitas antioksidan ekstrak daun jeruk purut dilakukan dengan metode DPPH dan uji aktivitas sitotoksik terhadap sel kanker hati HepG2 menggunakan metode MTT. Hasil: Ketiga jenis ekstrak mengandung flavonoid, alkaloid, dan triterpenoid, sedangkan senyawa tannin dan glikosida hanya ditemukan pada ekstrak etanol dan etil asetat. Uji KLT menunjukkan bahwa terdapat 14 komponen senyawa pada ekstrak etanol, 12 senyawa pada ekstrak etil asetat, dan 9 senyawa pada ekstrak heksana. Aktivitas antioksidan pada ekstrak etanol tergolong aktif (IC50 = 68,11 µg/mL), sedangkan pada ekstrak etil asetat tergolong sedang (IC50 = 163,01 µg/mL) dan tidak aktif pada ekstrak heksana. Efek sitotoksisitas terhadap sel HepG2 pada ekstrak heksana tergolong aktif (IC50 = 19,93 µg/mL), sedangkan pada ekstrak etil asetat (IC50 = 43,54 µg/mL) dan ekstrak etanol (IC50 = 57,33 µg/mL) tergolong sedang. Kesimpulan: Ekstrak daun jeruk purut berpotensi untuk dikembangkan menjadi antioksidan alami dan terapi alternatif untuk pengobatan kanker hati.
.....Introduction: Liver cancer is a cancer with a high prevalence rate both globally and nationally. Liver cancer is also ranked fourth as the highest cause of mortality in Indonesia. Liver cancer management such as surgery, liver transplantation, thermal ablation, and chemotherapy have many side effects and are expensive. This research is aimed to evaluate the kaffir lime leaves (Citrus hystrix DC) as an antioxidant and cytotoxic agent against HepG2 liver cancer cells. Method: Maceration and extract of kaffir lime leaves were carried out using polar solvents (ethanol), semipolar (ethyl acetate), and non-polar (n-hexane). Phytochemical tests and thin layer chromatography (TLC) were carried out to determine the phytochemical content of kaffir lime leaf extract. The antioxidant activity test of kaffir lime leaf extract was carried out using the DPPH method and the cytotoxic activity test against HepG2 liver cancer cells using the MTT method. Results: All three types of extracts contain flavonoids, alkaloids, and triterpenoids, while tannin and glycoside compounds were only found in the ethanol and ethyl acetate extracts. TLC test showed that there were 14 compound components in the ethanol extract, 12 compounds in the ethyl acetate extract, and 9 compounds in the hexane extract. The antioxidant activity in the ethanol extract was classified as active (IC50 = 68.11 µg/mL), while in the ethyl acetate extract was classified as moderate (IC50 = 163.01 µg/mL) and inactive in the

hexane extract. The cytotoxic effect on HepG2 cells in the hexane extract was classified as active (IC50 = 19.93 µg/mL), while in the ethyl acetate extract (IC50 = 43.54 µg/mL) and ethanol extract (IC50 = 57.33 µg/mL) were classified as moderate. Conclusion: Kaffir lime leaf extract has the potential to be developed into a natural antioxidant and alternative therapy for the treatment of liver cancer.