# Phytochemical Analysis, Antioxidant Activity, and In-Vitro Study of Cherry Tomato (Solanum Lycopersicum, Var Cerasiforme) Extract Towards Colon HT-29 Cancer Cells = Analisis Fitokimia, Aktivitas Antioksidan, dan Studi In-Vitro Ekstrak Tomat Ceri (Solanum Lycopersicum, Var Cerasiforme) Terhadap Sel Kanker Usus Besar HT-29

Fahrayhansyah Muhammad Faqih, author



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Abstrak

Background: Colon cancer is being the third most-prevalent type of cancer worldwide. Options for treatment and therapy are available including surgery, chemotherapy, radiotherapy, and many other therapies. Even though, the treatment of cancer nowadays is quite challenging due to numerous factors, such as socio-economic, geographic, and side effects. Chery tomatoes potentially can come up to be the alternative treatment of cancer due to its active components and cytotoxicity. This alternative treatment might also prevent the resistance of the main treatment of cancer. From several studies, it is found that the tomatoes have a decent antioxidant activity and cytotoxic capability towards various cancer cells. This study aims to determine the phytochemicals components, antioxidant activity and cytotoxic effect of the cherry tomatoes (Solanum lycopersicum Var. cerasiforme) towards HT-29 colon cancer cells.

Method: Solanum lycopersicum Var. cerasiforme was grinded until it becomes juice. Maceration is done with solvent of petroleum ether, ethyl acetate, and methanol, which results petroleum ether, ethyl acetate, and methanol extract of Solanum lycopersicum Var. cerasiforme, respectively. The three extracts undergo phytochemical screening and thin layer chromatography (TLC) to determine the amount and secondary metabolite of the phytochemical components, followed by measuring antioxidant activity by DPPH assay, and evaluating the cytotoxic activity towards HT-29 colon cancer cells by MTT assay.

Results: Solanum lycopersicum Var. cerasiforme extract contained secondary metabolites of flavonoids, alkaloids, tannins, saponins, and triterpenoids and there was a total of 8 phytochemical components. Among the three extracts, ethyl acetate extract showed a the highest (active) antioxidant activity towards DPPH free radical with IC50 of 47.655 g/mL and an active cytotoxic evaluation with IC50 of 63.224 g/mL. Petroleum ether extract has shown the highest cytotoxic value with IC50 of 32.676 g/mL (active). Meanwhile, methanol is categorized as moderate cytotoxic evaluation with 108.992 g/mL.

Conclusion: Solanum lycopersicum Var. cerasiforme extract contained phytochemical components that had biological activity of antioxidant toward DPPH free radical and cytotoxic effect towards HT-29 colon cancer cell.

.....Latar Belakang: Kanker kolorektal merupakan kanker yang paling umum ketiga di seluruh dunia. Pilihan untuk pengobatan yang tersedia termasuk operasi, kemoterapi, radioterapi. Namun, pengobatan kanker saat ini cukup menantang karena beberapa faktor, seperti sosio-ekonomi, geografi, dan efek samping. Tomat ceri berpotensi menjadi alternatif pengobatan kanker karena kandungan komponen aktif dan sitotoksisitas-nya.

Dari beberapa penelitian diketahui bahwa tomat memiliki aktivitas antioksidan dan kemampuan sitotoksik yang cukup baik terhadap berbagai sel kanker. Penelitian ini bertujuan untuk mengetahui komponen fitokimia, aktivitas antioksidan dan efek sitotoksik tomat ceri (Solanum lycopersicum Var. cerasiforme) terhadap sel kanker kolorektal HT-29.

Metode: Solanum lycopersicum Var. cerasiforme digiling hingga menjadi jus. Maserasi dilakukan ke dengan petroleum eter, etil asetat, dan metanol, yang menghasilkan ekstrak masing-masing pelarut untuk Solanum lycopersicum Var. cerasiforme masing-masing. Tiga ekstrak menjalani penapisan fitokimia dan kromatografi lapis tipis (KLT) untuk mengetahui jumlah dan metabolit sekunder komponen fitokimia, dilanjutkan dengan pengukuran aktivitas antioksidan dengan uji DPPH, dan evaluasi aktivitas sitotoksik terhadap sel kanker usus besar HT-29 dengan uji MTT.

Hasil: Ekstrak Solanum lycopersicum Var. cerasiforme mengandung metabolit sekunder flavonoid, alkaloid, tannin, saponin dan triterpenoid dengan total 8 komponen fitokimia. Diantara ketiga ekstrak tersebut, ekstrak etil asetat menunjukkan aktivitas antioksidan tertinggi terhadap radikal bebas DPPH dengan IC50 sebesar 47,655 g/mL dan evaluasi sitotoksik aktif dengan IC50 sebesar 63.224 g/mL. Ekstrak petroleum eter menunjukkan nilai sitotoksik tertinggi dengan IC50 sebesar 32,676 g/mL (aktif). Sedangkan metanol sebesar 108,992 g/mL.

Kesimpulan: Ekstrak Solanum lycopersicum Var. cerasiforme mengandung komponen fitokimia yang memiliki aktivitas biologis antioksidan terhadap radikal bebas DPPH dan aktivitas sitotoksik terhadap sel HT-29 kanker usus besar.