

Efek dan mekanisme antiviral ekstrak metanol daun dimocarpus longan lour, terhadap virus hepatitis C = Antiviral mechanism and effects of methanol extracts of dimocarpus longan lour leaves against hepatitis C virus

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Abstrak

Latar Belakang: Hepatitis C merupakan penyakit yang disebabkan oleh Virus Hepatitis C (HCV) dan dapat mengakibatkan peradangan hati, biasanya bersifat asimtomatik, bahkan kronik yang ditandai dengan sirosis, kanker hati, kelainan fungsi hati yang dapat menyebabkan kematian. Pengobatan standar dengan PEGinterferon- α dan ribavirin memiliki efek samping yang berat, sehingga diperlukan pengobatan alternatif sebagai anti-HCV. Dimocarpus longan merupakan tanaman yang memiliki khasiat sebagai antijamur, antivirus, antiinflamasi, antioksidan, antibakteri, dan antikanker. Tujuan penelitian ini untuk mengetahui efek dan mekanisme kerja ekstrak metanol daun D. longan terhadap virus Hepatitis C.

Metode: Cell line derivate Human hepatocarcinoma (Huh 7it-1) diinfeksi dengan HCV strain JFH1 dari genotipe 2a yang diinduksikan ekstrak metanol daun D. longan selama dua hari, kemudian diukur virus yang terbentuk ekstraseluler dan intraseluler. Pemeriksaan virus ekstraseluler dengan cara focus forming assay sedangkan intraseluler dengan qRT-PCR, western blot dan relative fluorescence assay. Pengujian sitotoksitas terhadap Huh 7it-1 dengan metode MTT assay. Ekstrak metanol daun D. longan diuji adanya kandungan saponin, flavonoid, triterpenoid dan steroid, tanin, dan glikosida.

Hasil: Konsentrasi hambatan 50% (IC₅₀) ekstrak terhadap HCV sebesar $13,2 \pm 0,52$ g/ml dan toksik 50% (CC₅₀) terhadap sel Huh 7it-1 sebesar $681,9 \pm 13,2$ g/ml dengan nilai indeks selektivitas (SI) sebesar 51,2. Efek virusidal ekstrak metanol daun D. longan secara langsung terhadap HCV berupa pengurangan titer virus sebesar 99%. Analisis RNA dan protein NS3 HCV intraseluler memperlihatkan adanya hambatan sebesar 20%. Kandungan fitokimia yang terdapat pada ekstrak metanol daun D. longan di antaranya saponin, flavonoid, triterpenoid dan steroid, alkaloid, tanin, dan glikosida.

Kesimpulan: Mekanisme anti-HCV dari ekstrak metanol daun D. longan diduga melalui adanya hambatan pada entry dan post-entry yang bekerja dengan menghambat pada penempelan virus, membunuh virus dengan interaksi langsung, menghambat ekspresi NS3, dan menghambat replikasi. Kandungan fitokimia yang terkandung seperti saponin, flavonoid, triterpenoid dan steroid, tanin, dan glikosida.

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Background: Hepatitis C is a disease caused by the hepatitis C virus (HCV). HCV infection can lead to inflammation of liver tend to be asymptomatic, and chronic characterized by cirrhosis, liver cancer, abnormal liver function can cause mortality. Standard HCV treatment with PEG-interferon- α and ribavirin have severe side effects, necessitating alternative treatments as anti-HCV. Dimocarpus longan is a plant that previously reported has antifungal, antiviral, anti-inflammatory, antioxidant, antibacterial, and anticancer activity. The purpose of this study is determine the effects and mechanism of action of the methanol extract

of leaves of *D. longan* against hepatitis C virus.

Methods: A derivative of Human hepatocarcinoma Cell line (Huh 7it-1) was infected with HCV of genotype 2a JFH1 strain which is induced with methanol extracts of *D. longan* for two days and then number of virus produced outside of the cell (extracellular) and inside of the cell (intracellular) were measured by focus forming assay, while intracellular virus was measured by qRT-PCR, western blot and relative fluorescence assay. Cytotoxicity against Huh 7it-1 was tested by MTT assay. Examination of phytochemical content *D. longan* showed the presence of saponins, flavonoids, triterpenoids and steroids, alkaloids, tannins, and glycosides.

Result: *D. longan* concentration of inhibition 50% (IC₅₀) and Toxic effects of concentration of cytotoxicity 50% (CC₅₀) against cells Huh 7it-1 were obtained $13,2 \pm 0.52$ ug/ml and 681.9 ± 13.2 ug/ml, respectively and with selectivity index (SI) 51.2. Result of direct virucidal effect was shown inhibition of titer virus 99%. RNA and NS3 protein analysis of HCV were shown inhibition 20%. Phytochemical contains of methanol extracts of *Dimocarpus longan* Lour. Leaves are saponins, flavonoids, triterpenoids and steroids, tannins, and glycosides.

Conclusion: Anti-HCV mechanisms of methanol extracts of *Dimocarpus longan* Lour. Leaves are inhibition at entry and post-entry with action at attachment, direct killing, inhibition of expression NS3, and replication. Phytochemical content in the methanol extract of leaves of *D. longan* were saponins, flavonoids, triterpenoids and steroids, tannins, and glycosides.