

# Kajian potensi antivirus daun *Achyranthes aspera* terhadap replikasi virus dengue in vitro = Study of potential antiviral effect of *Achyranthes aspera* leaf on dengue virus replication in vitro

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## Abstrak

Infeksi virus dengue (DENV) masih merupakan masalah di seluruh wilayah Indonesia. Diperkirakan sebanyak 2,5 juta jiwa rentan terinfeksi DENV. Telah diupayakan kontrol transmisi DENV namun tidak dapat menekan transmisi penyakit. Terapi definitif dengue belum ada, padahal kadar virus dalam tubuh berhubungan dengan keluaran keparahan penyakit. Oleh sebab itu, penanganan infeksi DENV dititikberatkan pada antiviral dan vaksin.

*Achyranthes aspera* merupakan tanaman obat yang diketahui mengandung alkaloid, sterol, triterpene, flavonoid, dan kumarin. Tanaman ini menunjukkan aktivitas antibakteri, antifungi, antioksidan dan antiviral terhadap Epstein Barr Virus.

Penelitian ini akan memperlihatkan efek ekstrak daun *Achyranthes aspera* terhadap replikasi DENV in vitro dengan mencari IC<sub>50</sub>, CC<sub>50</sub>, dan Selectivity Index (SI). Sel Huh7it-1 diinfeksi dengan DENV yang telah diberi ekstrak dengan berbagai konsentrasi: 10, 20, 40, 80, 160, 320 g/ml. Nilai IC<sub>50</sub> didapatkan menggunakan metode Focus Assay, sementara CC<sub>50</sub> dengan uji MTT. Data kemudian dianalisis dengan uji Kruskal-Wallis.

Hasil analisis menunjukkan IC<sub>50</sub> ekstrak sebesar 43,29 g/ml dan CC<sub>50</sub> sel tidak terinfeksi sebesar 239,69 g/ml. Kemudian didapatkan Indeks Selektivitas sebesar 5,53. Hasil uji kemaknaan menunjukkan semua konsentrasi terdapat perbedaan kecuali konsentrasi 20 dan 10 g/ml. Kesimpulannya, ekstrak daun *Achyranthes aspera* menunjukkan efek inhibisi terhadap replikasi DENV dan tidak bersifat toksik terhadap sel pada konsentrasi inhibisi, sehingga dapat dikembangkan sebagai antiviral dimasa mendatang.

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Dengue virus (DENV) infection is still a major problem in almost all area of Indonesia. Approximately, 2.5 billion people are vulnerable to be infected. The efforts to control DENV transmission had been done but they are not enough. The amount of virus infecting the body has a positive correlation with the severity of the disease yet definitive therapy has not yet been found. Thus, treatments developed for dengue are mainly focusing on antivirals and vaccines.

*Achyranthes aspera* is a medicinal plant which contains alkaloid, sterol, triterpene, flavonoid, and coumarine. Previous studies show that the plant has antibacterial, antifungal, antioxidant activities as well as antiviral to Epstein Barr Virus.

This research was conducted to evaluate the antiviral potency of *Achyranthes aspera* through IC<sub>50</sub>, CC<sub>50</sub>, and Selectivity Index (SI). Huh7it-1 cells were infected with DENV which had been mixed with extracts in various concentration: 10,20,40,80,160,320 g/ml. IC<sub>50</sub> was determined by Focus Assay while MTT test was used to determine CC<sub>50</sub>. Data were analyzed using Kruskal-Wallis test.

The results showed the IC<sub>50</sub> and CC<sub>50</sub> of the extract were 43.29 g/ml and 239.69 g/ml respectively and Selectivity Index 5.53. There was a significant difference ( $p < 0,05$ ) in all concentrations except 20 and 10 g/ml. The leaf extract of *Achyranthes aspera* showed inhibition against DENV replication and was not toxic

for cells. Thus, it could be developed as antivirals in the future.