

# Isolasi dan penentuan struktur serta uji bioaktivitas senyawa kimia dari Daun Binahong *Anredera cordifolia* (Ten.) Steenis = Isolation, chemical structure elucidation and bioactivity test of the chemical compound of Binahong Leaves *Anredera cordifolia* (Ten.) Steenis

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## Abstrak

Telah dilakukan penelitian isolasi dan identifikasi untuk mengungkapkan kandungan senyawa kimia dari daun tanaman *Anredera cordifolia* (Ten.) Steenis yang dikenal dengan nama binahong dan diperoleh dari perkebunan tanaman obat BALITTRO, Lembang. Sampel daun kering diekstraksi dengan metanol dan hasilnya difraksinasi dengan n-heksana, etil asetat dan n-butanol. Setiap fraksi dilakukan uji aktivitas, yang meliputi uji toksisitas terhadap larva udang *A. salina* Leach, antioksidan dengan metode DPPH, antimikroba serta uji sitotoksitas terhadap sel leukemia murine P388 dan sel kanker payudara T-47D. Isolasi dilakukan dengan teknik kromatografi kolom, dilanjutkan dengan pemurnian menggunakan teknik kromatografi lapis tipis preparatif dan HPLC preparatif. Penentuan struktur molekul dilakukan dengan menganalisis data spectrum UV-Vis, Infra merah, LC-MS, <sup>1</sup>H-NMR, <sup>13</sup>C-NMR, DEPT, 2D-NMR meliputi HMQC dan HMBC.

Hasil isolasi terhadap ekstrak daun *A. cordifolia* diperoleh 3 senyawa, yaitu satu senyawa yang diusulkan sebagai senyawa baru pada tanaman *A. cordifolia* yaitu 8-Glucopyranosyl-4',5,7-trihydroxyflavone, dan 2 senyawa lainnya yaitu senyawa adenine dan senyawa (9'Z,9''Z)-propane-1,2,3-triyl trioleat.

Berdasarkan hasil uji bioaktivitas BSLT, ekstrak metanol, n-heksana, etil asetat, n-butanol dan isolat 8-Glucopyranosyl-4',5,7-trihydroxyflavone toksik terhadap larva udang *A. salina* masing-masing mempunyai nilai LC<sub>50</sub> 46,19; 542,05; 32,06; 79,72 dan 24,74 g/mL. Hasil uji aktivitas antioksidan seluruh ekstrak bersifat aktif, kecuali ekstrak n-heksana tidak aktif, masing-masing dengan nilai IC<sub>50</sub> 53,11, 256,23 57,96, 132,39 dan 68,07g/mL.

Hasil uji aktivitas antibakteri terhadap *S. aureus*, *E. coli* dan *C. albicans*, ekstrak n-heksana tidak memiliki daya hambat, ekstrak etil asetat lebih aktif dibandingkan dengan ekstrak metanol, dan n-butanol terhadap bakteri *S. aureus*, pada konsentrasi 500 mg/1mL. Ekstrak metanol daun *A. cordifolia* tidak mempunyai potensi aktif terhadap sel murine P388 dan T-47D, tetapi ekstrak etil asetat mempunyai potensi aktif terhadap sel murine P388 dengan IC<sub>50</sub> 62,74 g/mL. Senyawa 8-Glucopyranosyl-4',5,7-trihydroxyflavon, tidak aktif terhadap sel T-47D tetapi aktif terhadap sel P388 dengan nilai IC<sub>50</sub> 87,13 g/mL. Isolat adenine mempunyai potensi aktif terhadap sel murine P388 maupun sel kanker payudara T-47D dengan nilai IC<sub>50</sub> 89,08 dan 39 g/mL.

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A research has been conducted to reveal the isolation and identification of bioactive constituents of leaves *Anredera cordifolia* (Ten.) Steenis (local name known as binahong) and obtained from the plantation of medicinal plants in BALITTRO, Lembang. Dried leaf samples were extracted with methanol and the results were fractionated with n-hexane, ethyl acetate and n-butanol respectively. It was tested biological activity, to toxicity on Brine shrimp test of *A. salina* Leach, an antioxidant with the DPPH method, antimicrobial and cytotoxicity test against murine P388 leukemia cells and breast cancer cells T-47D. Isolation was carried out

by column chromatography techniques, followed by purification using preparative thin layer chromatography techniques and preparative HPLC. Determination of molecular structure performed by analyzing the UV-Vis spectrum data, Infrared, LC-MS, <sup>1</sup>H-NMR, <sup>13</sup>C-NMR, DEPT, <sup>2</sup>D-NMR include HMQC and HMBC.

The results of isolation of the leaf extract of *A.cordifolia* were obtained three compounds, a compound that is proposed as a new compound in this plant that is 8-Glucopyranosyl-4',5,7-trihydroxyflavone and two other compounds are adenine and (9<sup>Z</sup>,7<sup>Z</sup>)-propane-1,2,3-triyl trioleat.

The results of bioactivity BSLT, methanol extract, n-hexane, ethyl acetate, n-butanol and isolates 8-Glucopyranosyl-4',5,7-trihydroxyflavone were toxic to shrimp larvae *A.salina* with LC<sub>50</sub> values : 53,11; 256,23; 57,96; 132,39; and 68,07g/mL. The results antioxidant activity, all of extract active except for n-hexane fraction with IC<sub>50</sub> values 53,11; 256,23; 57,96; 132,39 and 68,07 g/mL.

The results of the antibacterial activity against *S.aureus*, *E.coli* and *C.albicans* , n-hexane extracts had no inhibitory power, the ethyl acetate extract was more active than the methanol and n-butanol extract against bacteria *S.aureus* at a concentration of 500 mg/1 mL. Methanol extract of leaves of *A.cordifolia* was not potentially active against murine P388 and T-47D cells, ethyl acetate extract was shown activity against murine P388 cells with IC<sub>50</sub> values 62,74 g/mL. The compounds 8-Glucopyranosyl-4',5,7-trihydroxyflavone, not active against T-47D cells but was active against P388 cells with IC<sub>50</sub> values 87,13 g/mL. Isolate adenine was active against murine P388 cells and breast cancer cells T-47D with IC<sub>50</sub> values 89,08 and 39 g/mL, respectively.