ISOLASI DAN KARAKTERISASI SENYAWA TRITERPENOID KULIT BATANG MAHONI (*Aglaia foveolata*) SERTA UJI AKTIVITASNYA SEBAGAI ANTIOKSIDAN DAN ANTIKANKER

ANSELMANIA KARTINI DHEY
21/483974/PPA/06179

INTISARI

Dalam penelitian ini, senyawa triterpenoid telah diekstraksi dari kulit batang mahoni (*Aglaia foveolata*) dan dilakukan uji aktivitasnya sebagai antioksidan dan antikanker terhadap sel kanker payudara MCF-7. Ekstraksi dilakukan menggunakan pelarut etanol dan padatan yang diperoleh didispersikan ke dalam air lalu dipartisi dengan pelarut n-heksana (1:1) (v/v), dilanjutkan dengan pelarut etil asetat dan n-butanol. Padatan hasil partisi diskrining toksisitasnya dan dilakukan pemisahan terhadap ekstrak etil asetat menggunakan kolom kromatografi gravitasi. Fraksi hasil kolom diskrining dan diperoleh fraksi aktif yang selanjutnya dimurnikan dengan preparatif RP-HPLC. Struktur isolat hasil pemurnian ditentukan dengan spektroskopi UV-Vis, LC-HRMS, FTIR dan NMR 1D dan 2D. Aktivitas antioksidan isolat diuji dengan metode ABTS dan sifat antikanker diuji dengan metode MTT terhadap sel kanker payudara MCF-7.

Hasil skrining toksisitas padatan partisi diperoleh ekstrak etil asetat aktif dalam penghambatan pertumbuhan sel kanker payudara MCF-7. Isolat hasil kolom diperoleh dua fraksi sebagai senyawa tunggal (F8 dan F38) dan 11 fraksi yang diskrining toksisitasnya. Fraksi F15 dan F21 bersifat toksik dengan persen viabilitas sel sebesar 0,09 dan 2,12%. Pemurnian kedua fraksi ini diperoleh dua senyawa tunggal. Hasil identifikasi diperoleh senyawa asam 20S,24S-epoksi-25-hidroksi-3,4-secodammar-4(28)-ena-3-oat (**1**), asam 17,24-epoksi-25-hidroksi-3-oksobakaran-21-oat (**2**), 17,24-epoksi-25-hidroksibakaran-3-on (**3**), dan senyawa *β*-stigmasterol glukosida (**4**). Aktivitas antioksidan terhadap radikal ABTS diperoleh senyawa **1** sangat kuat, senyawa **2** dan **4** bersifat antioksidan kuat dan senyawa **3** lemah dengan nilai IC_{50} 25,68, 54,50, 62,87, dan 187,18 µg/mL secara berurutan. Hasil uji antikanker diperoleh senyawa **2** dan **4** bersifat toksik moderat, senyawa **1** nontoksik dan senyawa **3** lemah dengan nilai IC_{50} 94,59, 175,11, 535,11 dan 446,87 µg/mL.

Kata kunci: antioksidan, *Aglaia foveolata*, antikanker, senyawa triterpenoid, ABTS

ISOLATION AND CHARACTERIZATION TRITERPENOID COMPOUNDS OF MAHONI (Aglaia foveolata) STEM BARK AND ITS ACTIVITY AS ANTIOXIDANT AND ANTICANCER

ANSELMANIA KARTINI DHEY
21/483974/PPA/06179

ABSTRACT

The isolation of triterpenoid compounds from the stem bark of mahoni (*Aglaia foveolata*) and its activity test as an antioxidant and anticancer have been carried out. Extraction was conducted with ethanol and the crude extract was dispersed into water and partitioned with n-hexane (1:1) (v/v), followed with ethyl acetate, and n-butanol. Extracts were evaluated for their toxicity and the active extract separated by gravity column chromatography. The column fraction was screened and the active fraction was purified by preparative RP-HPLC. The structure of the isolated compounds was determined by UV-Vis, LC-HRMS, FTIR, and 1D, 2D NMR spectroscopy. Antioxidant assay of the isolated compounds was done using ABTS and anticancer using MTT assay against breast cancer cells MCF-7.

Ethyl acetate extract was active to inhibit growth of breast cancer cells MCF-7. Separation by column chromatography obtained two fractions as single compounds (F8 and F38) and 11 fractions were screened for toxicity. Fractions F15 and F21 were found toxic with cell viability 0.09 and 2.12%. Purification of these fractions isolated two single compounds. These compounds were identified as 20S,24S-epoxy-25-hydroxy-3,4-secodammar-4(28)-en-3-oic acid (**1**), 17,24-epoxy-25-hydroxy-3oxobaccaran-21-oic acid (**2**), 17,24-epoxy-25-hydroxybaccaran-3-on (**3**), and *β*-stigmasterol glucoside (**4**). Compound **1** has proven antioxidant properties for the most active compound, compounds **2** and **4** were active and compound **3** was weak antioxidant properties with IC_{50} values of 25.68, 54.50, 62.87, and 187.18 µg/mL, respectively. Compounds **2** and **4** were established to be moderate toxicity, while compound **1** was not toxic and compound 3 was weak toxicity against MCF-7 with IC_{50} values of 94.59, 175.11, 535.11 and 446.87 µg/mL, respectively.

Keywords: antioxidant, *Aglaia foveolata*, anticancer, triterpenoid compounds, ABTS