Potensi Ekstrak Daun dan Ranting *Castanopsis argentea* (Blume) A. DC. dalam Menginduksi Apoptosis Sel Kanker Servik HeLa

Intisari

Castanopsis argentea (Blume) A.DC atau Saninten merupakan salah satu jenis tumbuhan anggota suku Fagaceae. Perubahan lingkungan dan aktivitas manusia menurunkan populasi *Castanopsis* sehingga terancam punah. Untuk mendukung upaya konservasinya, studi bioprospeksi ini dilakukan untuk melihat potensi *C. argentea* sebagai agen antikanker. Penelitian ini bertujuan untuk mengevaluasi fraksi potensial *C. argentea* dalam menginduksi gen *p53, Bax* dan *Casp3* pada sel kanker servik HeLa. Ekstrak daun dan ranting *C. argentea* dimaserasi dengan pelarut etil asetat, etanol 70% dan aquades dan dikeringkan dengan *rotary evaporator*. Keenam ekstrak dievaluasi aktivitas sitotoksisitasnya dengan MTT assay dan ekstrak etil asetat ranting memiliki aktivitas terbaik dengan nilai IC_{50} 37,76 μg/mL. Ekstrak terpilih difraksinasi dengan *Vacuum Liquid Chromatography* (VLC) menggunakan campuran pelarut kloroform, etil asetat dan etanol dengan berbagai ratio dari non polar menuju polar dan dihasilkan 6 fraksi. Hasil uji sitotoksisitas fraksi *C. argentea* menunjukkan fraksi 2 dengan pelarut kloroform:etil asetat (75:25) merupakan fraksi potensial dengan nilai IC_{50} 44,74 μg/mL. Fraksi tidak bersifat toksik pada sel Vero dengan nilai *selectivity index* 7,11. Hasil uji kematian sel secara *flowcytometry* menunjukkan bahwa IC_{50} fraksi terpilih dapat menginduksi kematian sel melalui apoptosis sebesar 33%, sel nekrosis 16,8% dan sel hidup 50,8%. Hasil analisis ekspresi gen menunjukkan bahwa pemberian fraksi terpilih selama 18 jam mampu meningkatkan ekspresi *p53, Bax* dan *Casp3* dengan nilai *fold change* berturut-turut adalah 10,28 ± 2,73; 46,71 ± 2,06 dan 9,79 ± 2,14. Hasil penelitian ini menunjukkan bahwa fraksi 2 memiliki aktivitas antikanker pada sel kanker servik HeLa, sehingga dapat dijadikan sebagai kandidat agen kemoprevensi dalam pengobatan kanker.

Kata kunci: Kanker servik, *Castanopsis argentea,* apoptosis, HeLa, antikanker.

Potential of *Castanopsis argentea* (Blume) A. DC. Leaf and Branch Extracts in Inducing Apoptosis of HeLa Cervical Cancer Cells

Abstract

Castanopsis argentea (Blume) A.DC or Saninten is one of the plant species of the Fagaceae tribe. Environmental changes and human activities have reduced the population of *Castanopsis*, making it threatened with extinction. To support its conservation efforts, this bioprospection study was conducted to see the potential of *C. argentea* as an anticancer agent. This study aims to evaluate the potential fractions of *C. argentea* in inducing *p53, Bax* and *Casp3* genes in HeLa cervical cancer cells. *C. argentea* leaf and branch extracts were macerated with ethyl acetate, 70% ethanol and aquadest solvents and dried with a rotary evaporator. The six extracts were evaluated for cytotoxicity activity by MTT assay and the ethyl acetate extract of the branch had the best activity IC_{50} value of 37,76 µg/mL. The selected extracts were fractionated by Vacuum Liquid Chromatography (VLC) using a mixture of chloroform, ethyl acetate and ethanol solvents with various ratios from non-polar to polar and produced 6 fractions. The results of the cytotoxicity test of *C. argentea* fractions showed that fraction 2 with chloroform:ethyl acetate solvent (75:25) was a potential fraction with an IC50 value of 44,74 µg/mL. The fraction is not toxic to vero cells with a selectivity index value of 7,11. The results of cell death test by flow cytometry showed that the IC_{50} of the selected fraction can induce cell death through apoptosis by 33%, necrosis cells 16.8% and live cells 50.8%. The results of gene expression analysis showed that the tretment of selected fractions for 18 hours was able to increase the expression of *p53, Bax* and *Casp3* with fold change values of 10,28 ± 2,73; 46,71 ± 2,06 and 9,79 ± 2,14 respectively. The results of this study indicate that fraction 2 has anticancer activity on HeLa cervical cancer cells, and therefore can be used as a candidate chemoprevention agent in cancer treatment.

Keywords: Cervical cancer, *Castanopsis argentea*, apoptosis, HeLa, anticancer