ANTICANCER ACTIVITY OF SIMPOR (*Dillenia suffruticosa* Martelli) LEAF EXTRACTS FROM BELITUNG AGAINST HeLa CERVICAL CANCER CELLS

THESIS

Submitted in partial fulfillment of the requirements
For the degree with honors of Bachelor of Science

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The author realizes that this thesis is still far from perfect. Therefore, the author hopes for constructive criticism and suggestions from readers. Constructive criticism and suggestions can improve and help the author to continue to develop in the future. Hopefully this report can help and add insight and be useful for readers in general and the author in particular.

Jakarta, 1 Januari 2024

Raudhah Hana Syahira

ABSTRACT

RAUDHAH HANA SYAHIRA. Anticancer Activity of Simpor (*Dillenia suffruticosa* Martelli) Leaf Extracts from Belitung against HeLa Servical Cancer Cells. Thesis, Biology Study Program, Faculty of Mathematics and Natural Sciences, Jakarta State University. Under the guidance of SRI RAHAYU, JUNG-SHAN CHANG.

Cancer is a malignant tumor with characteristics of uncontrolled cell growth, poor metastasis, leading to the dysfunction of organs and death of patients. Many efforts have been made, including the exploration of natural products. The purpose of this study was to analyzing the cytotoxic activity of simpor leaf extract against HeLa cell line by MTT assay and to determine the ability of the extract to induce apoptosis in HeLa cell lines. The method used an experimental research design with a completely randomized design. The treatment group consisted of the leaf extract of 500, 1,000, 2,000, 5,000, and 9,000 ppm for BSLT. The MTT used 25, 50, 75, and 100 ppm concentrations and controls. The data on the BSLT was determined by analyzing LC_{50} value using the probit analysis, while the MTT was determined by analyzing IC_{50} and analyzed statistically using ANOVA. The BSLT results showed an LC_{50} value of 959,215 ppm, which means that the leaf extract is toxic. Simpor leaf extract at 75 ppm with IC_{50} of 25,07 was seen as the best concentration for cervical cancer treatment. The extract were able to induce apoptosis in HeLa cells best at 50 ppm with 93,3% . It can be concluded that *D. suffruticosa* shows cytotoxicity against the HeLa cell line and can be used as a candidate for cervical cancer treatment.

Key words: Cytotoxicity, BSLT, simpor *Dillenia*, leaf, Annexin V/PI, HeLa cell line.

ABSTRAK

RAUDHAH HANA SYAHIRA. Aktivitas Antikanker Ekstrak Daun Simpor (Dillenia suffruticosa Martelli) Asal Belitung Terhadap Sel Kanker Serviks HeLa. Tesis, Program Studi Biologi, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Negeri Jakarta. Di bawah bimbingan SRI RAHAYU, JUNG-SHAN CHANG.

Kanker adalah tumor ganas dengan ciri-ciri pertumbuhan sel yang tidak terkendali, metastasis yang buruk, menyebabkan disfungsi organ dan kematian pasien. Berbagai upaya telah dilakukan, termasuk eksplorasi hasil alam. Tujuan penelitian ini adalah menganalisis aktivitas sitotoksik ekstrak daun simpor terhadap cell line HeLa dengan uji MTT dan mengetahui kemampuan ekstrak dalam menginduksi apoptosis pada cell line HeLa. Metode yang digunakan adalah desain penelitian eksperimen dengan rancangan acak lengkap. Kelompok perlakuan terdiri dari ekstrak daun 500, 1.000, 2.000, 5.000, dan 9.000 ppm untuk BSLT. MTT menggunakan konsentrasi dan kontrol 25, 50, 75, dan 100 ppm. Data pada BSLT ditentukan dengan menganalisis nilai LC_{50} menggunakan analisis probit, sedangkan MTT ditentukan dengan menganalisis IC_{50} dan dianalisis secara statistik menggunakan ANOVA. Hasil BSLT menunjukkan nilai LC_{50} sebesar 959,215 ppm yang berarti ekstrak daun tersebut bersifat toksik. Ekstrak daun simpor pada konsentrasi 75 ppm dengan IC_{50} 25,07 dipandang sebagai konsentrasi terbaik untuk pengobatan kanker serviks. Ekstrak tersebut mampu menginduksi apoptosis pada sel HeLa paling baik pada konsentrasi 50 ppm dengan persentase 93,3%. Dapat disimpulkan bahwa D. suffruticosa menunjukkan sitotoksisitas terhadap lini sel HeLa dan dapat digunakan sebagai kandidat pengobatan kanker serviks.

Kata kunci: Sitotoksisitas, BSLT, simpor *Dillenia*, daun, Annexin V/PI, garis sel HeLa.

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