





THE POTENTCY OF Cratoxylum formosum AS NOVEL THERAPY AGAINST BREAST CANCER

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DEPARTMENT OF BIOLOGY FACULTY OF MATHEMATIC AND NATURAL SCIENCE **IPB UNIVERSITY BOGOR** 2024



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Bogor, August 2024

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ABSTRACT

ALIYA NUR FADHILAH. The Potency of Cratoxylum formosum as Novel Therapy Against Breast Cancer. Supervised by RIKA INDRI ASTUTI and NATTANAN (PANJAWOROYAN) T-THIENPRASET.

This study investigates the potential anticancer properties of *Cratoxylum* formosum extracts against MDA-MB-231 breast cancer cells. Cratoxylum formosum extracts were obtained using three different solvents: methanol, ethanol, and water. Extraction involved maceration and freeze-drying, resulting in extracts with varied concentrations and colors. MTT assays were employed to assess cytotoxicity on MDA-MB-231 cells, Vero cells, and EpH4-EV cells. The results indicated a concentration-dependent increase in MDA-MB-231 cell viability, notably with the ethanol extract, suggesting potential growth inhibition of cancer cells. Probit analysis yielded IC₅₀ values of 0.69 µg/mL, 0.72 µg/mL, and 1.73 mL for ethanol, methanol, and water extracts, respectively, highlighting their potential as potent anticancer agents. While the ethanol extract demonstrates a smaller IC₅₀, indicating high potency, it also exhibited toxicity to healthy cells. Conversely, the water extract showed a larger IC₅₀, implying a lower inhibitory effect on cancer cells with reduced toxicity to healthy cells, suggesting a potential balance between efficacy and safety. The study suggests that C. formosum extracts may induce apoptosis in MDA-MB-231 cells, emphasizing their potential as selective inhibitors of cancer cell growth. This research significantly contributes to understanding the diverse bioactive components in C. formosum and their potential applications in developing targeted anticancer therapies.

Keywords: anticancer, breast cancer, cytotoxicity, MDA-MB-231 cells, solvent extraction

ABSTRAK

ALIYA NUR FADHILAH. Potensi Cratoxylum formosum sebagai Terapi Baru terhadap Kanker Payudara. Dibimbing oleh RIKA INDRI ASTUTI dan NATTANAN (PANJAWOROYAN) T-THIENPRASET.

Penelitian ini menyelidiki potensi sifat antikanker dari ekstrak Cratoxylum formosum terhadap sel kanker payudara MDA-MB-231. Ekstrak Cratoxylum formosum diperoleh menggunakan tiga pelarut yang berbeda: metanol, etanol, dan air. Ekstraksi dilakukan melalui makerasi dan pengeringan beku, menghasilkan ekstrak dengan konsentrasi dan warna yang bervariasi. Uji MTT digunakan untuk menilai sitotoksisitas pada sel MDA-MB-231, sel Vero, dan sel EpH4-EV. Hasil menunjukkan peningkatan viabilitas sel MDA-MB-231 yang bergantung pada konsentrasi, terutama dengan ekstrak etanol, yang mengindikasikan potensi penghambatan pertumbuhan sel kanker. Analisis probit menghasilkan nilai IC₅₀ sebesar 0,69 μg/mL, 0,72 μg/mL, dan 1,73 μg/mL untuk ekstrak etanol, metanol, dan air, masing-masing, yang menunjukkan potensi mereka sebagai agen antikanker yang kuat. Meskipun ekstrak etanol menunjukkan IC50 yang lebih kecil, mengindikasikan potensi tinggi, ekstrak ini juga menunjukkan toksisitas terhadap sel sehat. Sebaliknya, ekstrak air menunjukkan IC50 yang lebih besar, mengimplikasikan efek penghambatan yang lebih rendah pada sel kanker dengan toksisitas yang berkurang terhadap sel sehat, menunjukkan potensi keseimbangan antara efektivitas dan keamanan. Penelitian ini menyarankan bahwa ekstrak C. formosum dapat memicu apoptosis pada sel MDA-MB-231, menekankan potensi mereka sebagai penghambat selektif pertumbuhan sel kanker. Penelitian ini memberikan kontribusi signifikan dalam memahami komponen bioaktif yang beragam di C. formosum dan potensi aplikasinya dalam pengembangan terapi antikanker yang terarah.

Kata kunci: antikanker, ekstraksi pelarut, kanker payudara, sel MDA-MB-231, sitotoksisitas



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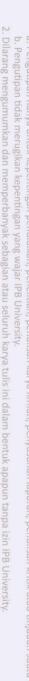
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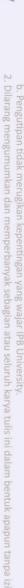


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ALIYA NUR FADHILAH

Undergraduate Thesis Intended to acquire Bachelor Degree in **Biology Study Program**

DEPARTMENT OF BIOLOGY FACULTY OF MATHEMATIC AND NATURAL SCIENCE **IPB UNIVERSITY BOGOR** 2024





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Bogor, August 2024

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