

EFEK EKSTRAK ETANOLIK KULIT BATANG KELOR (*Moringa oleifera* Lam.) TERHADAP MIGRASI SEL DAN SIKLUS SEL KANKER PAYUDARA T47D

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INTISARI

Tanaman kelor (*Moringa oleifera* Lam.) merupakan salah satu tanaman herbal yang banyak tumbuh di Indonesia. Pada kelor diketahui terdapat berbagai macam fitokimia seperti flavonoid, alkaloid, steroid, fenolat, dan tanin. Senyawa-senyawa tersebut berpotensi sebagai kandidat antikanker. Penelitian ini dilakukan dengan tujuan untuk menguji kandungan kulit batang kelor terhadap migrasi sel dan siklus sel pada sel kanker payudara T47D. Metode yang digunakan dalam penelitian ini antara lain ekstraksi kulit batang kelor dengan menggunakan etanol 96%, uji migrasi sel menggunakan metode *scratch wound healing assay* dan siklus sel menggunakan metode *flow cytometry*. Konsentrasi ekstrak etanolik kulit batang kelor yang digunakan dalam uji migrasi sel dan siklus sel adalah $1/4IC_{50}$ (166,65 $\mu\text{g/mL}$); $1/2IC_{50}$ (333,3 $\mu\text{g/mL}$); IC_{50} (666,65 $\mu\text{g/mL}$); dan $2IC_{50}$ (1333,3 $\mu\text{g/mL}$) dengan perlakuan pada kelompok kontrol sel, kontrol DMSO 0,01% serta kontrol doksorubisin dengan konsentrasi 0,5 dan 1 $\mu\text{g/mL}$. Data dianalisis dengan *One-Way ANOVA* ($p \leq 0,05$) dan uji letak beda nyata *Tukey*. Hasil menunjukkan EEKKBK IC_{50} (666,6 $\mu\text{g/mL}$) menghambat penutupan luka sel jam ke-24 sebesar $10,43 \pm 6,70\%$ dan jam ke-48 sebesar $32,26 \pm 12,34\%$. Serta EEKKBK $2IC_{50}$ (1333,3 $\mu\text{g/mL}$) penurunan kecepatan migrasi sel sebesar $0,43 \pm 0,44 \mu\text{m/jam}$ dan $0,85 \pm 0,61 \mu\text{m/jam}$ pada pengamatan ke-24 dan 48 jam. Sementara pada siklus sel, kontrol doksorubisin 1 $\mu\text{g/mL}$ dapat menghambat pertumbuhan sel kanker payudara T47D karena akumulasi sel pada fase G_2/M dan EEKKBK dari konsentrasi $1/4IC_{50}$ (166,65 $\mu\text{g/mL}$); $1/2IC_{50}$ (333,3 $\mu\text{g/mL}$); IC_{50} (666,65 $\mu\text{g/mL}$); dan $2IC_{50}$ (1333,3 $\mu\text{g/mL}$) adanya pengurangan proporsi sel di fase G_1 dan S mengindikasikan penghambatan siklus sel dan replikasi DNA.

Kata kunci: antioksidan, kanker payudara, kulit batang kelor, migrasi sel, siklus sel.

**THE EFFECT OF ETHANOLIC EXTRACT OF (*Moringa Oleifera* Lam.)
BARK ON THE CELL MIGRATION AND CELL CYCLE OF T47D
BREAST CANCER CELLS**

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ABSTRACT

Moringa oleifera Lam. is one of the herbal plants that grows abundantly in Indonesia. Moringa is known to contain various phytochemicals such as flavonoids, alkaloids, steroids, phenols, and tannins. These compounds have the potential to be anticancer candidates. This study was conducted to test the content of moringa bark extract on cell migration and cell cycle in T47D breast cancer cells. The methods used in this study included extraction of moringa bark using 96% ethanol, cell migration testing using the scratch wound healing assay method, and cell cycle testing using *flow cytometry*. The concentrations of moringa bark ethanol extract used in the cell migration and cell cycle assays were $1/4IC_{50}$ (166.65 $\mu\text{g/mL}$); $1/2IC_{50}$ (333.3 $\mu\text{g/mL}$); IC_{50} (666.65 $\mu\text{g/mL}$); and $2IC_{50}$ (1333.3 $\mu\text{g/mL}$) with treatment in the cell control group, 0.01% DMSO control, and doxorubicin control at concentrations of 0.5 and 1 $\mu\text{g/mL}$. Data were analysed using *One-Way* ANOVA ($p \leq 0.05$) and Tukey's post-hoc test. The results showed that EEKKBK IC_{50} (666.6 $\mu\text{g/mL}$) inhibited wound closure at 24 hours by $10.43 \pm 6.70\%$ and at 48 hours by $32.26 \pm 12.34\%$. Additionally, EEKKBK $2IC_{50}$ (1333.3 $\mu\text{g/mL}$) reduced the rate of wound closure by $0.43 \pm 0.44 \mu\text{m/hour}$ and $0.85 \pm 0.61 \mu\text{m/hour}$ at the 24-hour and 48-hour observations, respectively. Meanwhile, in the cell cycle, the doxorubicin control at 1 $\mu\text{g/mL}$ inhibited the cell migration of T47D breast cancer cells due to cell accumulation in the G_2/M phase, and EEKKBK at concentrations of $1/4IC_{50}$ (166.65 $\mu\text{g/mL}$); $1/2IC_{50}$ (333.3 $\mu\text{g/mL}$); IC_{50} (666.65 $\mu\text{g/mL}$); and $2IC_{50}$ (1333.3 $\mu\text{g/mL}$) concentrations. The reduction in the proportion of cells in the G_1 and S phases indicates inhibition of the cell cycle and DNA replication.

Keywords: antioxidant, cell cycle, cell migration, breast cancer, moringa bark.