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Studi Pengaruh Senyawa Eucalyptol (1,8 Sineol) terhadap Viabilitas dan Ultrastruktur Sel HeLa = Study of the effects of Eucalyptol (1,8 Sineol) on the viability and ultrastructure of HeLa cell

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Abstrak

Kanker serviks menjadi salah satu penyebab kematian tertinggi di seluruh dunia setiap tahunnya. Upaya untuk mengobati penyakit kanker baik dengan cara kemoterapi dan imunologik juga telah dilakukan, namun kemoterapi berkepanjangan dapat memicu resistensi sel kanker karena kemoterapi kurang selektif terhadap sel kanker. Eucalyptol telah dilaporkan memiliki beberapa sifat obat yang meliputi antibakteri, antijamur, dan aktivitas antheimintik. Eucalyptol telah dilaporkan dapat menginduksi kematian sel karsinoma kulit (A431), osteosarcoma (MG-63) dan keratinosit manusia (HaCaT). Akan tetapi pengaruh senyawa eucalyptol pada sel HeLa belum diketahui. Penelitian ini bertujuan untuk mengetahui pengaruh konsentrasi eucalyptol (25 µg/mL, 50 µg/mL, 100 µg/mL, 200 µg/mL) terhadap viabilitas sel HeLa dengan metode Trypan Blue, ScepterTM 3.0, dan ultrastruktur sel HeLa dengan metode Scanning Electron Microscope (SEM). Hasil analisis statistik dengan tingkat kepercayaan 0,05 menunjukkan terdapat perbedaan signifikan nilai persentase viabilitas dengan metode trypan blue antara kontrol dan perlakuan. Hasil pengamatan dengan ScepterTM 3.0 menunjukkan bahwa senyawa eucalyptol dapat menekan konsentrasi sel dan menyebabkan penyusutan sel. Hasil pengamatan kualitatif dengan scanning electron microscope menunjukkan perubahan ultrastruktur sel HeLa pada sampel perlakuan. Hal tersebut menunjukkan bahwa konsentrasi eucalyptol sebesar 25 µg/mL, 50 µg/mL, 100 µg/mL, dan 200 µg/mL berpengaruh terhadap viabilitas, konsentrasi sel, diameter sel, volume sel, dan ultrastruktur sel HeLa. Konsentrasi senyawa eucalyptol 200 µg/mL cenderung paling tinggi menekan viabilitas konsentrasi sel, diameter sel, volume sel, dan ultrastruktur sel HeLa dibanding konsentrasi lain.

.....Cervical cancer is one of the leading causes of death worldwide every year. Efforts to treat cancer both by chemotherapy and immunologic methods have also been carried out, but prolonged chemotherapy can trigger cancer cell resistance because chemotherapy is less selective against cancer cells. Eucalyptol has been reported to have several medicinal properties which include antibacterial, antifungal, and anthelmintic activity. Previous studies have reported that eucalyptol can induce cell death of skin carcinoma (A431), osteosarcoma (MG-63), and human keratinocytes (HaCaT). Nevertheless, its effects on HeLa cell viability and ultrastructure have not been evaluated. This study aims to determine the effect of eucalyptol concentration (25 g/mL, 50 g/mL, 100 g/mL, 200 g/mL) on the viability of HeLa cells using the Trypan Blue, ScepterTM method. 3.0, and ultrastructure of HeLa celss using Scanning Electron Microscope (SEM). The results of statistical analysis with a confidence level of 0.05 showed that there was a significant difference in the percentage of viability with the trypan blue method between the control and treatment. The results of observations with ScepterTM 3.0, eucalyptol can suppress cell concentration and cell shrinkage. The results of qualitative observations using a scanning electron microscope showed changes in the ultrastructure of HeLa cells in the treatment samples. This shows that the eucalyptol concentrations of 25 g/mL, 50 g/mL, 100 g/mL, and 200 g/mL affected the viability, cell concentration, cell diameter, cell volume, and morphology of HeLa cells. The concentration of eucalyptol at 200 g/mL tends to affect the

viability, cell concentration, cell diameter, cell volume, and morphology of HeLa cells compare to other concentrations.