INTISARI

Latar Belakang: *Blue light* adalah cahaya tampak dengan panjang gelombang antara 400 - 500 nm. Sumber *blue light* yaitu sinar matahari, layar digital, dan *light-emitting diodes* (LEDs). Paparan *blue light* dapat menimbulkan terbentuknya *Reactive Oxygen Species* (ROS), kerusakan DNA, dan disfungsi sel pada kulit. Iradiasi fibroblas oleh *bluelight* menyebabkan penurunan viabilitas sel. Salah satu tanaman yang memiliki kandungan flavonoid adalah *Caesalpinia sappan* (secang). Senyawa flavonoid yang memiliki efek antioksidan kuat adalah quercetin. Quercetin dapat meregulasi keseimbangan antioksidan dan oksidan untuk menekan stres oksidatif. Selain itu, kandungan brazilin *C.Sappan.* menunjukkan efek protektif terhadap stress oksidatif sehingga dikembangkan sebagai terapi potensial untuk mengatasi *photoaging.*

Tujuan: Mengetahui efek pemberian ekstrak etanol *C. sappan* dalam meningkatkan viabilitas sel pada sel fibroblas yang dipapar oleh *blue light*.

Metode: Penelitian ini merupakan penelitian eksperimental *in vitro* yang menggunakan sampel sel fibroblas manusia yang dikultur dalam medium DMEM *(Dubelcco's Modified Eagle Medium).*Pada uji MTT pengaruh ekstrak etanol kayu secang (*C.Sappan)* dalam 6 konsentrasi (250 µg/mL;125 µg /mL;dan 62,5 µg/mL; 31,3 µg /mL; 15,6 µg /mL dan 7,8 µg/mL),kontrol negatif dan ekstrak *Artemisia capillaris* sebagai kontrol positif yang dipapar *blue light* 21,6 J/cm^2. Peningkatan viabilitas dinilai dengan *Optical Density* (OD) dan Tingkat Viabilitas. statistik *one way ANOVA* dilanjutkan *Posthoc* LSD untuk melihat perbedaan kelompok perlakuan dan kontrol.

Hasil: Penurunan viabilitas sel fibroblas pada kelompok kontrol dengan paparan sinar biru *(blue light)* bermakna secara statistik ($p<0,005$).Viabilitas sel fibroblas dengan paparan sinar biru *(blue light)* mengalami peningkatan secara signifikan dengan pemberian ekstrak etanol kayu secang (*C.Sappan)* dengan konsentrasi 31,3 µg /mL; 15,6 µg /mL dan 7,8 µg/mL ($p<0,05$).

Kesimpulan: Ekstrak etanol kayu secang (*C.Sappan)* lebih meningkatkan viabilitas fibroblas yang dipapar *blue light* dibandingkan dengan *Artemisia capillaris.*

Kata kunci: *Caesalpinia sappan, quercetin, brazilin, blue light*

ABSTRACT

Background: *Blue light is a type of visible light with a wavelength ranging from 400 to 500 nm. Sources of blue light include sunlight, digital screens, and Light-Emitting Diodes (LEDs). Exposure to blue light can lead to the generation of Reactive Oxygen Species (ROS), DNA damage, and cell dysfunction of the skin. Blue light irradiation on fibroblasts can result in decreased cell proliferation and viability. Many plants, such as Caesalpinia sappan (secang), are known to contain flavonoids with antioxidant properties. Quercetin, a flavonoid with potent antioxidant effects, is commonly used as a positive control for assessing antioxidant activity. Quercetin plays a crucial role in balancing antioxidants and oxidants to combat oxidative stress. Additionally, brazilin found in C. Sappan exhibits a protective effect against oxidative stress, making it a promising therapy for treating photoaging.*

Objective: *This study aims to investigate the impact of administering the ethanol extract of C. sappan on improving cell viability in fibroblast cells that are exposed to blue light.*

Methods: *This in vitro experimental research involved human fibroblast cell samples cultured in DMEM (Dubelcco's Modified Eagle Medium). In the MTT test, the effect of C. Sappan ethanol extract was examined at six different concentrations (250 µg/mL, 125 µg/mL, 62.5 µg/mL, 31.3 µg/mL, 15.6 µg/mL, and 7.8 µg/mL), as well as a control group and Artemisia capillaris cells exposed to 21,6 J/cm^2 blue light. Increased viability is measured by Optical Density (OD) and Viability Level. One-way ANOVA analysis followed by post hoc LSD statistical evaluation was performed to identify differences between the treatment and control groups.*

Results*: The decrease in fibroblast cell viability in the control group with blue light exposure was statistically significant ($p<0.005$). Fibroblast cell viability with blue light exposureThe fibroblast viability significantly increased with the administration of C. Sappan ethanol extract at concentrations of 31.3 µg/mL, 15.6 µg/mL, and 7.8 µg/mL ($p < 0.05$).*

Conclusion: *Ethanol extract of C.Sappan have capability to increase the viability of fibroblasts exposed to blue light compared to Artemisia capillaris.*

Keywords*: Caesalpinia sappan, quercetin, brazilin, blue light, Artemisia capillaris*