INTISARI

Sel punca tanaman memiliki sifat meregenerasi seperti sel punca manusia. Salah satu sel punca tanaman yang telah diteliti adalah sel punca tanaman tomat. Telah diketahui bahwa sel punca tanaman tomat mengandung senyawa antioksidan yang bersifat sitoprotektif dan dapat melindungi sel dari paparan radikal bebas yang menyebabkan kerusakan dan kematian sel. Sumber radikal bebas seperti sinar UV dapat memicu peningkatan ekspresi mediator pro-inflamasi COX-2, sehingga menyebabkan terjadinya *inflammaging* yaitu penuaan yang didahului adanya proses inflamasi dalam tubuh. Penelitian ini bertujuan menguji aktivitas sitoprotektif dan pengaruh ekstrak air sel punca tanaman tomat terhadap ekspresi COX-2 pada *Human Dermal Fibroblast Adult* (HDFa) *cell line* yang dipapar sinar UV-B.

Ekstrak air sel punca tanaman tomat diperoleh dengan metode maserasi menggunakan pelarut *aquabidest*. Ekstrak diuji aktivitas sitoprotektifnya melalui pengamatan viabilitas sel dengan metode MTT *assay*. Kadar ekstrak yang memberikan viabilitas sel tertinggi digunakan untuk pengujian terhadap ekspresi COX-2 dengan metode imunositokimia. Hasil yang diperoleh dilakukan analisis statistik menggunakan SPSS dengan uji *One-Way* ANOVA dan *Post Hoc* Tukey LSD pada taraf kepercayaan 95%.

Berdasarkan hasil penelitian, sinar UV-B dosis 60 mJ/cm^2 menyebabkan kematian sel HDFa tertinggi dengan viabilitas sel sebesar 58,30$\pm$7,82%. Hasil uji aktivitas sitoprotektif melalui peningkatan persentase viabilitas sel menunjukkan ekstrak air sel punca tanaman tomat kadar 0,5 mg/mL memiliki efek sitoprotektif paling tinggi pada sel HDFa dibanding kadar lainnya dengan persentase viabilitas sel sebesar 103,77$\pm$3,08%. Uji pengaruh ekstrak air sel punca tanaman tomat terhadap ekspresi COX-2 menunjukkan bahwa ekstrak mampu menurunkan ekspresi COX-2 dengan persentase sel yang mengekspresikan COX-2 sebesar 2,88$\pm$2,75% dan hal ini mendekati keadaan normal sel tanpa paparan UV-B.

Kata kunci : Ekstrak air sel punca tanaman tomat, COX-2, viabilitas sel, HDFa.

ABSTRACT

Plant stem cells have regenerating properties like human stem cells. One of the plant stem cells that has been studied is tomato stem cells. It has known that tomato stem cells contain antioxidant compounds that are cytoprotective and can protect cells from exposure to free radicals that cause cell damage and death. Sources of free radicals such as UV light can trigger an increase in the expression of pro-inflammatory mediators such as COX-2, thus leads to inflammaging that is preceded by inflammation-mediated skin aging. This study aims to examine cytoprotective activity and the effect of water extract from tomato stem cells on the expression of COX-2 in the Human Dermal Fibroblast Adult (HDFa) cell line exposed to UV-B light.

Water extract from tomato stem cell was obtained by maceration method using aquabidest solvent. The extract was tested for cytoprotective activity by observing cell viability using the MTT assay method. The level of extract that gave the highest cell viability was used to test COX-2 expression by immunocytochemical method. The results obtained were carried out by statistical analysis using SPSS with One-Way ANOVA and Post Hoc Tukey LSD tests at the 95% confidence level.

Based on the results of the study, UV-B light at 60 mJ/cm^2 caused the highest HDFa cell death with cell viability up to 58,30$\pm$7,82%. The results of the cytoprotective activity test through the increase of cell viability percentage showed that water extract from tomato stem cells at 0,5 mg/mL showed the highest cytoprotective effect in HDFa cells compared to other levels with a cell viability percentage up to 103,77$\pm$3,08%. The effect of water extract from tomato stem cells on COX-2 expression showed that it was able to reduce COX-2 expression by the percentage of cells expressing COX-2 up to 2,88$\pm$2,75% and this approached the similar result of cells without UV exposure B.

Keywords: Water extract from tomato stem cell, COX-2, cell viability, HDFa.