

## ABSTRACT

### EFFECT OF *Achatina fulica*'s MUCUS TOWARDS EXPRESSION OF MONOCYTE CHEMOATTRACTANT PROTEIN-1 (MCP-1) AND VASCULAR ENDOTHELIAL GROWTH FACTOR (VEGF) IN THE AGING OF FIBROBLASTS DUE TO UVB LIGHT EXPOSURE

**Background:** Aging can be caused by intrinsic and extrinsic factors. The most common extrinsic factor is UV light. Java Island has a high UV light index value (7.8 - 13.6). Collagen destruction can be caused by UV light. Inflammation and angiogenesis characterized by MCP-1 and VEGF expression can be indicators of collagen destruction. *Achatina fulica*'s mucus is thought to reduce the aging process due to its component *acharan sulfat* and *achasin*.

**Objective:** To investigate the expression of mRNA MCP-1 and mRNA VEGF in aging fibroblasts due to UVB light exposure and given *Achatina fulica*'s mucus and to find out whether there is a correlation between mRNA MCP-1 and mRNA VEGF in aging fibroblasts.

**Methods:** This study was *quasi-experimental posttest only control group design*. The subjects of this study were fibroblasts which were divided into 6 groups: normal control group, negative control group, positive control group, AF3 group, AF15 group and AF6 group. Normal control group only contained fibroblasts in complete medium, into the negative control was added to UVB, positive control was added by PRP. Whereas the treatment group contained fibroblasts in a complete medium that was added by UVB and *Achatina fulica*'s mucus with each concentration of 3  $\mu$ l, 15  $\mu$ l, 62  $\mu$ l. The result analysis was using software IBM SPSS statistic version 23.

**Results:** The means of MCP-1 expression in group NC ( $1,000 \pm 0,000$ ), UVB ( $4,955 \pm 0,758$ ) which the highest expression in this study, PRP ( $1,422 \pm 0,328$ ), AF3 ( $1,874 \pm 0,123$ ), AF15 ( $1,433 \pm 0,503$ ), and AF62 which the lowest expression in this study ( $0,607 \pm 0,314$ ) were found to have significant difference among mean  $\pm$  SD of each group statistically ( $p < 0,05$ ) except for group NC vs PRP, NC vs AF15, AF3 vs AF15, PRP vs AF15; and the means of VEGF expression in group NC which the lowest expression in this study ( $1,000 \pm 0,000$ ), UVB which the highest expression in this study ( $15,019 \pm 0,273$ ), PRP ( $5,601 \pm 0,222$ ), AF3 ( $7,483 \pm 0,389$ ), AF15 ( $5,323 \pm 0,290$ ), and AF62 ( $3,517 \pm 0,241$ ) were found to have significant differences among mean  $\pm$  SD of each group statistically ( $p < 0,05$ ), except for group NC vs. AF15. Expression of MCP-1 and VEGF were found to correlate positively ( $r = 0,791$ ) and statistically significant ( $p = 0,000$ ).

**Conclusion:** Expression of mRNA MCP-1 and mRNA VEGF in UVB- induced fibroblast aging treated by *Achatina fulica*'s mucus are lower compared to negative and positive control. There is a positive relationship between MCP-1 expression and VEGF in the aging process of fibroblasts.

**Keywords:** Aging, fibroblasts, UVB, MCP-1, VEGF, *Achatina fulica*.

## INTISARI

### PENGARUH LENDIR *Achatina fulica* TERHADAP EKSPRESI *MONOCYTE CHEMOATTRACTANT PROTEIN- 1* (MCP-1) DAN *VASCULAR ENDOTHELIAL GROWTH FACTOR* (VEGF) PADA PENUAAN FIBROBLAS AKIBAT PAJANAN SINAR UVB

**Latar Belakang:** Penuaan dapat diakibatkan oleh faktor intrinsik dan ekstrinsik. Faktor ekstrinsik paling umum adalah sinar UV. Pulau Jawa memiliki nilai indeks sinar UV yang tergolong tinggi (7,8 – 13,6). Sinar UV dapat menyebabkan kerusakan kolagen yang mayoritas dibentuk fibroblas. Inflamasi dan *angiogenesis* yang ditandai dengan ekspresi MCP-1 dan VEGF dapat menjadi indikator kerusakan kolagen. Lendir *Achatina fulica* diduga dapat mengurangi proses penuaan karena mengandung *acharan sulfat* dan tembaga.

**Tujuan:** Mengkaji ekspresi mRNA MCP-1 dan mRNA VEGF pada penuaan fibroblas akibat pajanan sinar UVB yang diberi lendir *Achatina fulica* serta mengetahui apakah terdapat hubungan antara mRNA MCP-1 dan mRNA VEGF pada penuaan fibroblas.

**Metodelogi:** Penelitian ini menggunakan metode *quasi- experimental posttest only control group design*. Subyek penelitian ini adalah fibroblas dibagi menjadi 6 kelompok, yaitu kelompok kontrol normal, kontrol negatif, kontrol positif, kelompok AF3, kelompok AF15 dan kelompok AF6. Pada kelompok kontrol normal hanya berisi fibroblas dalam medium lengkap, kontrol negatif ditambahkan UVB, kontrol positif ditambahkan PRP. Sedangkan pada kelompok perlakuan berisi fibroblas dalam medium lengkap yang ditambahkan UVB dan lendir *Achatina fulica* dengan konsentrasi masing-masing 3  $\mu$ l, 15  $\mu$ l, 62  $\mu$ l. Hasil penelitian akan dianalisis menggunakan *software IBM SPSS statistic version 23*.

**Hasil:** Didapatkan rata-rata ekspresi MCP-1 pada kelompok NC (1,000  $\pm$  0,000), UVB (4,955  $\pm$  0,758) yang merupakan nilai tertinggi, PRP (1,422  $\pm$  0,328), AF3 (1,874  $\pm$  0,123), AF15 (1,433  $\pm$  0,503), dan AF62 (0,607  $\pm$  0,314) yang merupakan nilai terendah dengan perbedaan *mean  $\pm$  SD* yang signifikan secara spesifik ( $p < 0,05$ ) kecuali pada antar kelompok NC vs PRP, NC vs AF15, AF3 vs AF15, PRP vs AF15, ; serta ekspresi VEGF pada kelompok NC (1,000  $\pm$  0,000) yang merupakan nilai terendah, UVB (15,019  $\pm$  0,273) yang merupakan nilai tertinggi, PRP (5,601  $\pm$  0,222), AF3 (7,483  $\pm$  0,389), AF15 (5,323  $\pm$  0,290), dan AF62 (3,517  $\pm$  0,241) dengan perbedaan *mean  $\pm$  SD* yang signifikan secara spesifik ( $p < 0,05$ ), kecuali pada antar kelompok NC vs. AF15. Ekspresi MCP-1 dan VEGF berkorelasi positif ( $r = 0,791$ ) yang signifikan secara statistik ( $p = 0,000$ ).

**Kesimpulan:** Pemberian lendir *Achatina fulica* menyebabkan ekspresi mRNA MCP-1 dan mRNA VEGF lebih rendah pada fibroblas yang diberi pajanan sinar UVB. Terdapat hubungan positif antara ekspresi MCP-1 dan VEGF pada proses penuaan fibroblas.

**Kata Kunci:** Penuaan, fibroblas, UVB, MCP-1, VEGF, *Achatina fulica*.



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FIBROBLAS AKIBAT**

**PAJANAN SINAR ULTRAVIOLET B**

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