

Anti-melanogenic Activity of Extracts from *Carex pumila* Thunb. Inhabiting Along the Nakdong River (Republic of Korea)

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Carex pumila Thunb. is a plant native to East Asia, Australia, and New Zealand. However, its effect on skin melanogenesis has not been investigated. In the present study, we evaluated its anti-melanogenic properties using B16F10 melanoma cells and zebrafish larvae in the presence or absence of α -melanocyte stimulating hormone (α -MSH). In this study we revealed that concentrations below 50 $\mu\text{g/mL}$ did not induce any cytotoxicity in B16F10 melanoma cells and cardiotoxicity in zebrafish larvae. However, 50 $\mu\text{g/mL}$ treatment significantly inhibited α -MSH-induced extracellular (from $181.24\% \pm 0.62\%$ to $105.15\% \pm 0.31\%$) and intracellular melanin contents (from $119.8\% \pm 1.2\%$ to $53.4\% \pm 1.7\%$) as well as intracellular tyrosinase activity (from $143.9\% \pm 4.2\%$ to $103.7\% \pm 1.4\%$) in B16F10 melanoma cells. At 25 $\mu\text{g/mL}$ and 50 $\mu\text{g/mL}$ concentrations, it could significantly inhibit α -MSH induced hyperpigmentation in zebrafish larvae (from $100\% \pm 2.3\%$ to $60.7\% \pm 1.3\%$ and $47.5\% \pm 1.9\%$ respectively). Additionally, the extract suppressed α -MSH-induced cAMP-CREB-MITF signaling pathway and consequently inhibited tyrosinase expression in B16F10 melanoma cells. In conclusion, our results indicate that this plant extract could suppress the cAMP-CREB-MITF axis which consequently inhibits tyrosinase mediated melanogenesis.

Key words: *Carex pumila* Thunb., melanogenesis, α -MSH

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