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Anti-inflammatory effect of the ethanolic extract of *Heracleum moellendorffii*

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Introduction

Heracleum moellendorffii in the Apiaceae family and is a perennial plant that commonly grows in the Northeast Asia. The roots of *H.moellendorffii* are known to have antiviral effects. In addition, the roots have been shown to contain panaxynol and falcarindiol, ingredients that have effects of anti-inflammatory and delaying blood coagulation, and are a group in which research related to the development of new drugs is in progress. In Korea, the leaves of *H. moellendorffii* are consumed as vegetables, but there is not much research on the components or the effects of the leaves. This study investigated the effects of ethanol extracted of *H. moellendorffii* leaf on the lipopolysaccharide (LPS)-induced inflammatory response in RAW264.7 cells.

Methods and Results

RAW264.7 cells were pre-treated with 30% and 50% ethanol extract (HM30 and HM50) for 2 h, followed by stimulation with lipopolysaccharide (LPS) at 1 μg/mL for 24 h. The cytotoxicity of HM30 and HM50 was measured by MTT assay. The anti-inflammatory activity of HM30 and HM50 was measured by the Griess assay for nitric oxide (NO), as well as ELISA kits for inflammatory cytokines including IL-6 and TNF-α. The expression changes of inflammatory proteins, such as inducible nitric oxide synthase (iNOS), cyclooxygenase-2 (COX-2) proteins, were confirmed by Western blot analysis. HM30 and HM50 below 400㎍/㎖ did not affect the viability of RAW264.7 cells. Pre-treatment with HM30 and HM50 significantly suppressed the production of NO, IL-6, and TNF-α in LPS-induced inflammatory RAW264.7cells. In addition, the expression of inflammatory proteins iNOS and COX-2 was also dose-dependently reduced by HM30 and HM50.(Fig1,2)

Conclusion

HM30 and HM50 reduced the production and expression of inflammatory mediators including NO, IL-6, TNF-α, iNOS, and COX-2 in LPS-induced macrophages, indicating that *H. moellendorffii* leaf could be a candidate as an anti-inflammatory agent.

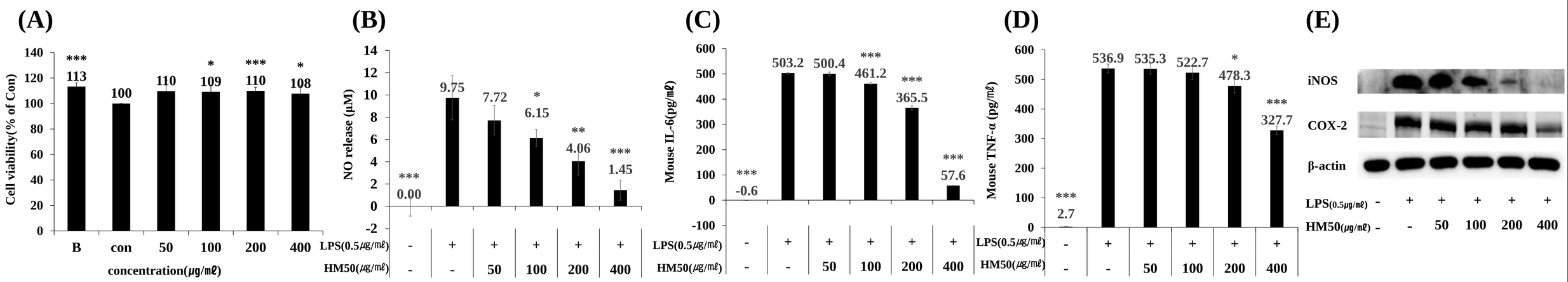

Fig.1 Effect of the HM50 extract on cell viability. Cells were treated with different con- centrations of extract for 24h and viability determined with the MTT assay (A). RAW264.7 cells were stimulated with the indicated concentrations of in the presence or absence of LPS (0.5 ㎍/㎖) for 24h amounts of NO were determined using the Griess reaction in culture medium (B) . The HM50 extract inhibits TNF- and IL-6 production in LPS-stimulated Raw264.7 cells measured with enzyme-linked immunosorbent assay (ELISA) using culture supernatants collected from treated cells (C and D). The expression of inflammatory proteins iNOS and COX-2 was also dose-dependently reduced by HM50(E).

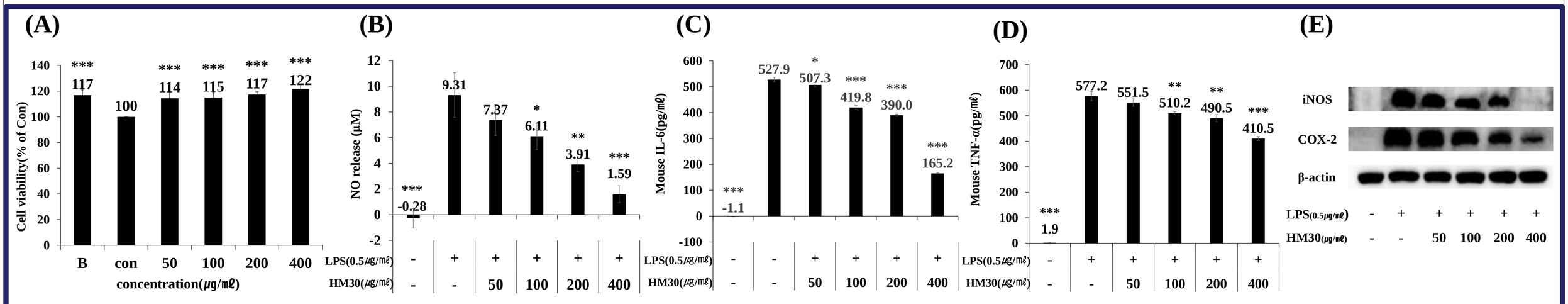

Fig.2 Effect of the HM30 extract on cell viability. Cells were treated with different con- centrations of extract for 24h and viability determined with the MTT assay (A). RAW264.7 cells were stimulated with the indicated concentrations of in the presence or absence of LPS (0.5 ㎍/㎖) for 24h amounts of NO were determined using the Griess reaction in culture medium (B) . The HM30 extract inhibits TNF- and IL-6 production in LPS-stimulated Raw264.7 cells measured with enzyme-linked immunosorbent assay (ELISA) using culture supernatants collected from treated cells (C and D). The expression of inflammatory proteins iNOS and COX-2 was also dose-dependently reduced by HM30(E).

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