Abstract

Inflammation is the body's initial response against harmful substances to restore homeostasis, involving the production of pro-inflammatory cytokines (TNF-α and IL-6). *Perilla frutescens* leaves have been widely utilized as herbal medicine with anti-inflammatory compounds, such as rosmarinic acid, luteolin, and apigenin. This study aims to evaluate the potential anti-inflammatory effects of dried perilla leaf extract (DPLE) on LPS-induced RAW264.7 cells, mimicking the onset of acute inflammation. The DPLE obtained through 80% methanol maceration was characterized using FTIR, functional groups associated with anti-inflammatory compounds were detected (O–H, C–H, C=O, and C=C). The WST-8 assay result maintained stable cell viability of 70% up to 200µg/mL DPLE (104.7 ± 23.19% to 184.15 ± 14.92%), while the 400µg/mL (71.2 ± 26.16%) showed potential cytotoxicity. Results from ELISA demonstrated a non-significant decreasing trend in TNF-α levels. Meanwhile, the IL-6 levels showed non-monotonic concentrations, with significance (p<0.05) detected at 50 µg/mL (270.8 ± 47.9 pg/mL) and 400 µg/mL (64.9 ± 15.27 pg/mL) compared to positive control (159.7 ± 25.6 pg/mL). Lastly, the RT-qPCR analysis showed the downregulation of *TNF-α* and *IL-6* gene expression at 200 µg/mL DPLE. As biological replicates were limited (n<3), the statistical analysis by one-way ANOVA and Dunnett's post hoc should be regarded as preliminary and interpreted with caution. In conclusion, DPLE demonstrated potential anti-inflammatory activity at 200 µg/mL concentration. However, these findings require further validation, such as conducting phytochemical quantification, griess assay, and increasing biological replicates (n≥3) to obtain reliable measure of statistical significance.

Keywords: acute inflammation, anti-inflammatory, perilla leaves, RAW264.7 cells, *in vitro*