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Bumble bee (*bombus terrestris*, L.) Venoms Downregulate Inducible Nitric Oxide Synthase and TNF- α in Macrophage Cell Line

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The effects of anti-inflammatory, antinociceptive and anticancer for honey bee venom have been reported by various researchers. We investigated the anti-inflammation of Korean domestic queen and worker Bumblebees (*Bombus terrestris*, L.) compared to honey bee venom. Bumblebees are important pollinators in the horticulture and is reared in indoor by artificially diet in bulk. In this study, the production of proinflammatory cytokines, nitric oxide (NO) and tumor necrosis factor- α (TNF- α) was examined in a macrophage like cell line, RAW 264.7 cells, in the presence of the venom from Bumblebees Queen (BQ) and worker water-soluble extracts. RAW 264.7 cells activated with lipopolysaccharide (LPS) were treated with various doses of BQ or BW extracts. Supernatants were analyzed for the production of NO and TNF- α using Griess reagent and enzyme-linked immunosorbent assay (ELISA) and western blot, respectively. BQ and BW extracts up to 10 ng/ml still required to inhibit NO and TNF- α induced by LPS. These results suggest the possibility that Bumblebee venom may be effective therapeutic agents for inflammatory diseases.

Keyword: Bumble bee, venom, inflammation, NO, TNF- α