

Investigating Prostaglandin E2 and Intracellular Oxidative Stress Levels in Lipopolysaccharide-Stimulated RAW 264.7 Macrophages upon Treatment with *Strobilanthes crispus*

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Abstract : Background: Uncontrolled inflammation may cause serious inflammatory diseases if left untreated. Non-steroidal anti-inflammatory drug (NSAIDs) is commonly used to inhibit pro-inflammatory enzymes, thus, reduce inflammation. However, long term administration of NSAIDs leads to various complications. Medicinal plants are getting more attention as it is believed to be more compatible with human body. One of them is a flavonoid-containing medicinal plants, *Strobilanthes crispus* which has been traditionally claimed to possess anti-inflammatory and antioxidant activities. Nevertheless, its anti-inflammatory activities are yet to be scientifically documented. Objectives: This study aimed to examine the anti-inflammatory activity of *S. crispus* by investigating its effects on intracellular oxidative stress and prostaglandin E₂ (PGE₂) levels. Materials and Methods: In this study, the Maximum Non-toxic Dose (MNTD) of methanol extract of both leaves and stems of *S. crispus* was first determined using 3-(4,5-dimethylthiazolyl-2)-2,5-diphenyltetrazolium Bromide (MTT) assay. The effects of *S. crispus* extracts at MNTD and half MNTD ($\frac{1}{2}$ MNTD) on intracellular ROS as well as PGE₂ levels in 1.0 μ g/mL LPS-stimulated RAW 264.7 macrophages were then be measured using DCFH-DA and a competitive enzyme immunoassay kit, respectively. Results: The MNTD of leaf extract was determined as 700 μ g/mL while for stem was as low as 1.4 μ g/mL. When LPS-stimulated RAW 264.7 macrophages were subjected to the MNTD of *S. crispus* leaf extract, both intracellular ROS and PGE₂ levels were significantly reduced. In contrast, stem extract at both MNTD and $\frac{1}{2}$ MNTD did not significantly reduce the PGE₂ level, but significantly increased the intracellular ROS level. Conclusion: The methanol leaf extract of *S. crispus* may possess anti-inflammatory properties as it is able to significantly reduce the intracellular ROS and PGE₂ levels of LPS-stimulated cells. Nevertheless, further studies such as investigating the interleukin, nitric oxide and cytokine tumor necrosis factor- α ; (TNF α ;) levels has to be conducted to further confirm the anti-inflammatory properties of *S. crispus*.

Keywords : anti-inflammatory, natural products, prostaglandin E2, reactive oxygen species

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