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碩士論文

Department of Food and Nutrition, Providence University

Department of Agricultural Technology, Soegijapranata Catholic University

Master Thesis

Jaboticaba 果實萃取物對於 LPS 誘導之斑馬魚胚胎的抗發炎活性

Anti-Inflammatory Activity of Jaboticaba Fruit Extract in Lipopolysaccharides (LPS)-induced Inflammation of Zebrafish Embryo

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Submitted in partial fulfillment of the requirements for a Food Technology Master's degree in Faculty of Agricultural Technology

By:

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19.I3.0005

SUMMARY

Inflammation can be defined as the immune system's response to harmful stimuli, such as pathogens, damaged cells, toxic compounds, or irradiation. Inflammation can be dangerous to human body because it may lead to various diseases. To help reduce inflammation, many people have been looking for natural sources of bioactive compounds. One of the examples is Myrciaria cauliflora (Jaboticaba), an edible fruit commonly found in Brazil. It contains considerable amount of polyphenols and other bioactive compounds which are beneficial for human health. Our previous studies showed the anti-inflammatory effect of Jaboticaba both in vitro and in vivo against COPD (Chronic Obstructive Pulmonary Disease) and IBD (Inflammatory Bowel Disease). To our knowledge, no publication on the anti-inflammatory effect of jaboticaba especially on the nerve protection, is available. Therefore, the purpose of this study is to examine the anti-inflammatory activity of jaboticaba fruit extract in LPS-induced zebrafish embryo. Jaboticaba peel and seed extracts were prepared by maceration in several concentrations of Ethanol and water. Zebrafish embryo is was used as model due to its ability to absorb the diluted small molecules in the surrounding water. Therefore, the bioactive compounds can be straightforward delivered to the targeted organs. Further, the effect of bioactive compounds can be easily observed due to the transparency of the embryos. Zebrafish embyros were divided into 6 groups, which are, LPS (Lipopolysaccharide)-induced group, LPS+Jaboticaba Peel Extract (JPE), LPS + Jaboticaba Seed Extract (JSE). The concentration of NO in zebrafish embryo is determined using Griess method, and the endocytosis of macrophage is observed using neutral red staining. While the proliferation of neutrophils is observed using Sudan Black staining. The result showed that jaboticaba fruit extract (especially the peel) may attenuate inflammation in a dose-dependent manner, indicated by reduction of both nitric oxide production and neutrophils proliferation. Extraction of jaboticaba peel is best done with 95% ethanol, followed by 50% ethanol and water. Although more work is needed to fully understand the critical role of jaboticaba on the inhibition of inflammation, our findings clearly demonstrate that jaboticaba may be a potential therapeutic intervention for the treatment of inflammatory disorders

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The author realizes that there were unintended errors in writing this report. The author really allows all readers to give suggestions to improve its content. However, the author hopes that this report can be an inspiration and provide useful information for others.

Semarang, July 20th 2021

Author,

Josephine Claretta Budiman (布蒂曼)

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