

Evaluation of Physiological Functionalities and Anti-inflammatory Activity on *In Vitro* Cultured Adventitious Root of *Platycodon grandiflorum*

Hee-Ock Boo^{1*}, Hag-Hyun Kim², Soo-Jeong Kwon², Sun-Hee Woo³

¹WELLPHYTO Co. Ltd., Gwangju 61005, KOREA

²Food Nutrition and Cookery, Woosong Information College, Daejeon 34606, KOREA

³Dept. of Crop Science, Chungbuk National University, Cheongju 28644, KOREA

[Introduction]

Platycodon grandiflorum is well known to affect various pharmacological effects for human health and its consumption is increasing. In order to develop functional products using the physiological functionality of PG is needed a mass production of natural materials through *in vitro* culture. The present study was focused to evaluate of phenolic compound content, anti-inflammatory and antioxidant activity of four varieties PG for biological search on plant-based anti-inflammatory and antioxidant agents.

[Materials and Methods]

Total phenols were determined by the modified method the Folin-Ciocalteu assay. Total flavonoid was measured using the modified method that previously described (Zhishen *et al.*, 1999). The spectrophotometric analysis of ABTS scavenging activity of PG was determined according to the method described previously (Re *et al.*, 1999). The nitrite scavenging activity was determined according to a method using Griess reagent. The evaluation of *in vitro* anti-inflammatory activity were evaluated by RAW 264.7 cells. The cells were incubated for 24h after treatment of 0.5 μ g/mL LPS at each samples. The levels of IL-1 β , IL-6, and TNF- α released into the culture supernatants were measured by using a commercially available cytokine ELISA test kits.

[Results and Discussions]

Total polyphenol and flavonoid content showed the highest amount in adventitious root extract of tetraploid PG, and followed by green petal, double petal and diploid PG extract. The DPPH radical scavenging activity showed that the increase was proportional to the concentration, and the ABTS radical scavenging activity was not significantly different among the PG varieties at the concentration of 5 mg/mL or more. The nitrite scavenging activity was affected by pH, at pH of 1.2, the effect of all of the extracts tested observed higher than that of the other two pH ranges. The cytotoxicity at various concentrations, the survival rate of RAW 264.7 cell was more than 90% at a concentration of 200 μ g/mL or less, and it was confirmed that the macrophage cell showed little toxicity. NO production inhibited a dose-dependent manner. The PG extracts showed a considerable range of influence on cytokine secretion. The effect of adventitious root extracts of PG against inflammatory mediators TNF- α , IL-6 and IL-1 β production showed the most significant anti-inflammatory activity.

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*Corresponding author: Tel. +82-10-6690-5636, E-mail, swboo@hanmail.net