

## Effects of *Morus alba* L. Leaf Extract on the Production of Nitric Oxide, Prostaglandin E<sub>2</sub>, and Cytokines in RAW264.7 Macrophages

Eun-Mi Choi<sup>1)</sup>, Jae-Kwan Hwang<sup>2)</sup> and Sung-Ja Koo<sup>1)</sup>

<sup>1)</sup>Department of Food and Nutrition, Kyunghee University

<sup>2)</sup>Department of Biotechnology & Bioproducts Research Center, Yonsei University

*Morus alba* L. has been known as a medicinal herb and its leaves are commonly used as a natural remedy against diabetes. In the present study, we examined the effects of *Morus alba* leaf extract on the inhibition of NO formation (for iNOS inhibitors), PGE<sub>2</sub> production (for COX-2 inhibitors) and cytokines (TNF- $\alpha$  and IL-6) production in lipopolysaccharide (LPS)-induced mouse macrophages RAW264.7 cells. *Morus alba* leaf methanolic extract and its fractions (chloroform, butanol, and aqueous fractions) were found to inhibit NO production in LPS-activated RAW264.7 macrophages without an appreciable cytotoxic effect at 4~100  $\mu$ g/ml. LPS-induced PGE<sub>2</sub> production was significantly ( $p < 0.05$ ) reduced only by butanol fraction. In addition, *Morus alba* leaf extract and its fractions significantly decreased the production of TNF- $\alpha$  ( $p < 0.05$ ) and IL-6 production was significantly ( $p < 0.05$ ) reduced by methanol extract (4 and 20  $\mu$ g/ml), chloroform fraction (4  $\mu$ g/ml), butanol fraction (4  $\mu$ g/ml) and aqueous fraction (4~100  $\mu$ g/ml). These findings suggest that *Morus alba* leaf extract is beneficial for inflammatory conditions and its butanol fraction inhibiting COX-2 and iNOS activities is warranted for further elucidation of active principles for development of new anti-inflammatory agents.

*Key words:* *Morus alba* L. nitric oxide; prostaglandin; cytokine