

Anti-inflammatory Effects of *Scrophularia Koraiensis* Nakai via NF- κ B and MAPK Signaling Pathways in LPS-induced Macrophages

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Scrophularia koraiensis Nakai is widely used to remedy fever, edema, and neuritis. *S. koraiensis* has harpagoside and angoroside C, these compounds have been reported to alleviate inflammation, rheumatic diseases, and analgesic stimulation. We evaluated the anti-inflammatory effects of the ethanol extract of *S. koraiensis* (SKE) in lipopolysaccharides (LPS)-induced macrophages. At cellular levels, SKE decreased the production of nitric oxide (NO), the expression of inducible nitric oxide synthase (iNOS), and cytokines (IL-1b, TNF-a, and IL-6) under the LPS stimulation. SKE inhibited the phosphorylation of nuclear transcription factor-kappa B (NF- κ B) p65 and its inhibitor (I κ B- α). In addition, SKE suppressed the phosphorylation of extracellular signal-regulated kinase (ERK), c-Jun N-terminal kinase (JNK), and p38 in the mitogen-activated protein kinase (MAPK) pathway. In conclusion, SKE could be considered a potential resource for attenuating inflammation response and it may be utilized in the material for cosmetics, food additives, and tea.

[본 연구는 중소벤처기업부의 지역주력산업육성(세종)사업의 일환인 ICT기반 스마트팜에서 재배된 지역자원을 활용한 바이오헬스케어 소재 개발 및 제품화(사업번호: S3270662)의 지원에 의해 이루어진 결과로 이에 감사드립니다.]

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