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Comparative study on the anti-inflammatory effects of the roots of *Coptis chinensis*, *Coptis japonica*, and *Picrorhiza kurroa*

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Objectives

The roots of *Coptis chinensis*, *Coptis japonica*, and *Picrorhiza kurroa* are the herbal medicines used traditionally for treatment of various diseases. Three species have been substituted indiscriminately for Coptidis Rhizoma and Picrorhizae Rhizoma for many years. In the present study, we investigated the anti-inflammatory effects of the roots of *Coptis chinensis*, *Coptis japonica*, and *Picrorhiza kurroa* in mouse macrophage cells to compare with their activities.

Materials and Methods

○ Materials

The roots of *Coptis chinensis*, *Coptis japonica*, and *Picrorhiza kurroa* were obtained from the Oriental Drug Stores (Omniherb Co., Jeongdoyakup, and paekjeyakup) in Korea. Mouse macrophage RAW 264.7 cells were from ATCC (Rockville, MD, USA). Lipopolysaccharide (LPS) and other chemicals were from Sigma (St. Louis, MO, USA). PGE_2 and NO assay kits were purchased from R&D Systems Inc. (Minneapolis, MN, USA).

○ Methods

RAW264.7 macrophages were incubated in medium containing 1 μg/mL lipopolysaccharide (LPS) and the test samples. After an additional 20-h incubation, The levels of prostaglandin E_2 (PGE_2) and nitric oxide (NO) in the medium were analyzed using the commercially available assay systems.

Results

The inhibitors of prostaglandin E_2 (PGE_2) biosynthesis and nitric oxide (NO) production have been considered as potential anti-inflammatory and cancer chemopreventive agents. Ethanolic extracts from the roots of *Coptis chinensis* and *Coptis japonica* exhibited significant inhibitory effects on generations of inflammatory PGE_2 and NO in LPS-stimulated RAW 264.7 cells. In particular, the extract from

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Coptis chinensis was more effective than others on PGE_2 production. However, *Picrorhiza kurroa* had no effect on them. Our results suggest that the roots of *Coptis chinensis* and *Coptis japonica* might possess more anti-inflammatory and/or cancer chemopreventive activity than that of *Picrorhiza kurroa* due to the suppressions of cyclooxygenase-2 (COX2)-mediated PGE_2 production and inducible nitric oxide synthase (iNOS)-mediated NO generation.