

Anti-inflammatory Effects of the Cone from *Pinus rigida* x *Pinus taeda* via NF- κ B and MAPK Signaling Pathways in Macrophages

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Pine (Pinaceae family such as *Pinus densiflora*, *P. rigida*, and *P.taeda*) has been used as traditional medicine, its various parts (pine needle, bark, sap) have been used for hemostasis, bruises, and burns. These species were reported that have phenolics and flavonoids. We evaluated the anti-inflammation effects of PRT in lipopolysaccharide (LPS)-induced macrophages. These results showed that the ethyl acetate fraction of cone from *Pinus rigida* x *P.taeda* (ECRT) stabilized free radicals by reducing reactive oxygen species (ROS) and decreasing the production of nitric oxide (NO). ECRT decreased the expressions of nitric oxide synthase (iNOS) and cyclooxygenase (COX-2). In addition, ECRT significantly suppressed mRNA levels of inflammation-related factors such as cytokines, iNOS, and COX-2. As a result, ECRT was related to alleviating various pro-inflammatory mediators through I κ B/NF- κ B signaling pathways, including p65 translocation to the nucleus.

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