

Ethanol Extract of *Cinnamomum cassia* Blume Bark Inhibits Apoptosis and Production of Bone-Resorbing Agents Induced by TNF- α in osteoblastic MC3T3-E1 cells

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The integrity of the skeleton requires a dynamic balance between bone formation and bone resorption, which are controlled by calcitropic hormones and cytokines. Cinnamon (*Cinnamomum cassia* Blume) is one of the world's oldest spices that have been used in food, beverage and cosmetic industry. In traditional Oriental medicine, cinnamon is one of the medicinal plants that have been used for improving various diseases caused by insufficient blood microcirculation. This medicinal plant has also been often administered to patients suffering from women's diseases. The ethanol extract from the bark of *Cinnamomum cassia* Blume (CCE) was tested for osteocalcin-inducing activity in osteoblastic MC3T3-E1 cells. CCE significantly increased osteocalcin secretion in MC3T3-E1 cells at the concentration of 10 and 50 g/ml ($P < 0.05$). Treatment with CCE (10 and 50 μ g/ml) prevented apoptosis induced by TNF- α (10^{-10} M) in osteoblastic cells. In the presence of TNF- α , culture with CCE (10 to 100 μ g/ml) for 48h inhibited production of IL-6 and nitric oxide in osteoblastic MC3T3-E1 cells. These results suggest that *Cinnamomum cassia* may contribute to the prevention for osteoporosis and inflammatory bone diseases.

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