Inhibition effects of adipocyte differentiation on 3T3-L1 cells and antioxidant properties of extracts of Geum japonicum

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Abstract

The murine 3T3-L1 preadipocyte cell line represents one of the most characterized in vitro models currently used to study adipocyte differentiation. The purpose of this study was to investigate the inhibitory activity of extracts of G. japonicum on the adipogenic differentiation of 3T3-L1 cells and antioxidants properties.Cells were fixed and stained with Oil Red O to assess lipid accumulation. Total lipid and triglyceride contents increased during the cell differentiation. The hexane fraction of G. japonicum extracts inhibited the accumulationof triglyceride droplets and the effect was dose-dependent.The activities of glycerolphosphate dehydrogenase(GPDH), a marker of adipose differentiation, was affected by the extracts of G. japonicum. The ethyl acetate fraction of G. japonicum methanol extract(EFGJ) showed a remarkable scavenging activity on the 1,1-diphenyl-2 picrylhydrazyl radical. EFGJ also showed excellent antioxidative activity on linoleic acid during long-period storage and on rat liver microsome peroxidation system, and good anti-peroxidation effect on lipid in Rancimat system using lard, parm oil, and perilla oil, as compared with BHT and a-tocopherol. The prevention of linoleic acid and linolenic acid peroxidation was superior to a-tocopherol, but inferior to BHT. These results suggest that extracts of G. japonicum may have an inhibitory role on the early stage of 3T3-L1 cell differentiation and may be useful source as natural antioxidants.

Reference

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