

Hypolipidemic activities of xanthorrhizol purified from centrifugal TLC

ABSTRACT

Hyperlipidemia is defined as the presence of either hypertriglyceridemia or hypercholesterolemia, which could cause atherosclerosis. Although hyperlipidemia can be treated by hypolipidemic drugs, they are limited due to lack of effectiveness and safety. Previous studies demonstrated that xanthorrhizol (XNT) isolated from *Curcuma xanthorrhiza* Roxb. reduced the levels of free fatty acid and triglyceride in vivo. However, its ability to inhibit cholesterol uptake in HT29 colon cells and adipogenesis in 3T3-L1 cells are yet to be reported. In this study, XNT purified from centrifugal TLC demonstrated 98.3% purity, indicating it could be an alternative purification method. The IC_{50} values of XNT were $30.81 \pm 0.78 \mu\text{g/mL}$ in HT29 cells and $35.07 \pm 0.24 \mu\text{g/mL}$ in 3T3-L1 adipocytes, respectively. Cholesterol uptake inhibition study using HT29 colon cells showed that XNT ($15 \mu\text{g/mL}$) significantly inhibited the fluorescent cholesterol analogue NBD uptake by up to $27 \pm 3.1\%$ relative to control. On the other hand, higher concentration of XNT ($50 \mu\text{g/mL}$) significantly suppressed the growth of 3T3-L1 adipocytes ($5.9 \pm 0.58\%$) compared to 3T3-L1 preadipocytes ($81.31 \pm 0.55\%$). XNT was found to impede adipogenesis of 3T3-L1 adipocytes in a dose-dependent manner from 3.125 to $12.5 \mu\text{g/mL}$, where $12.5 \mu\text{g/mL}$ significantly suppressed $36.13 \pm 2.1\%$ of lipid accumulation. We postulate that inhibition of cholesterol uptake, adipogenesis, preadipocyte and adipocyte number may be utilized as treatment modalities to reduce the prevalence of lipidemia. To conclude, XNT could be a potential hypolipidemic agent to improve cardiovascular health in the future.

Keyword: Xanthorrhizol; Centrifugal TLC; HT29 colon cells; 3T3-L1 adipocytes; Cholesterol; Adipogenesis