

Development of Anti-Obesity Agent from Resource Plants

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Obesity is a physical condition that results from excessive storage of fat in the body. The present study examined the anti-obesity effects of the selected natural medicine, *Galla rhois* extract (GRE) and solvent fractions on 3T3-L1 preadipocytes and *in vivo* studies. Here, we show that EtOAc fraction of *Galla rhois* inhibits the differentiation of the 3T3-L1 preadipocytes induced by differentiated medium in a dose-dependent manner. To investigate the effect of the GRE-EtOAc fraction on obesity in high fat diet-fed C57BL/6 mice, which included a normal diet (ND), high-fat diet (HFD) and HFD+GRE concentration-dependent, were fed to the mice for 6 weeks. The GRE-EtOAc fraction was inhibited the highest adipocyte differentiation *in vitro*, the GRE supplement significantly decreased body weight and visceral fat mass compared to the HFD group. The total cholesterol and triglyceride levels in the plasma were significantly decreased by GRE supplementation compared with those of the HFD group. Also, we aimed to determine the differentiation inhibition and the modulation of differentiation genes brought about by the *Galla rhois* in adipocyte. A cDNA microarray-based method was introduced for the high contents screening (HCS) of gene expressions. This technology has revolutionized gene expression studies by providing the means to measure mRNA levels in thousands of genes simultaneously in simple and complex biological samples. 13 genes were founded to be affected in their expression levels by more than 5-fold up-regulation after 4 days treatment with the EtOAc fraction from *Galla rhois*. Otherwise, 21 genes were founded to be affected in their expression levels by more than 5-fold down-regulation treated with the EtOAc fraction. Therefore, *Galla rhois* extract may be considered for use in a therapeutic agent to control obesity.

Key words : *Galla rhois*, *Rhus javanica*, anti-obesity, adipocyte, High fat diet.