

Scopariadulcis (SDF7) endowed with glucose uptake properties on L6 myotubes compared insulin.

ABSTRACT

Aim of the study Insulin stimulates glucose uptake and promotes the translocation of glucose transporter 4 (Glut 4) to the plasma membrane on L6 myotubes. The aim of this study is to investigate affect of Scopariadulcis Linn water extracts on glucose uptake activity and the Glut 4 translocation components (i.e., IRS-1, PI 3-kinase, PKB/Akt2, PKC and TC 10) in L6 myotubes compared to insulin. Materials and methods Extract from TLC fraction-7 (SDF7) was used in this study. The L6 myotubes were treated by various concentrations of SDF7 (1 to 50 µg/ml) and insulin (1 to 100 nM). The glucose uptake activities of L6 myotubes were evaluated using 2-Deoxy-D-glucose uptake assay in with or without fatty acid-induced medium. The Glut 4 translocation components in SDF7-treated L6 myotubes were detected using immunoblotting and quantified by densitometry compared to insulin. Plasma membrane lawn assay and glycogen colorimetry assay were carried out in SDF7- and insulin-treated L6 myotubes in this study. Results Here, our data clearly shows that SDF7 possesses glucose uptake properties on L6 myotubes that are dose-dependent, time-dependent and plasma membrane Glut 4 expression-dependent. SDF7 successfully stimulates glucose uptake activity as potent as insulin at a maximum concentration of 50 µg/ml at 480 min on L6 myotubes. Furthermore, SDF7 stimulates increased Glut 4 expression and translocation to plasma membranes at equivalent times. Even in the insulin resistance stage (free fatty acids-induced), SDF7-treated L6 myotubes were found to be more capable at glucose transport than insulin treatment. Conclusions Thus, we suggested that Scopariadulcis has the potential to be categorized as a hypoglycemic medicinal plant based on its good glucose transport properties.

Keyword: Scopariadulcis; Insulin; Insulin resistance; Glucose transport; Glut 4.