

Polyphenol-rich ethyl acetate fraction isolated from *Molineria latifolia* ameliorates insulin resistance in experimental diabetic rats via IRS1/AKT activation

ABSTRACT

This study aimed to evaluate the effect of ethyl acetate fraction (EAF) isolated from *Molineria latifolia* rhizome as dietary interventions for type 2 diabetes mellitus (T2DM) and its underlying molecular mechanisms *in vivo*. Experimental rats were induced by high fat diet feeding coupled with combined exposure to streptozotocin and nicotinamide. Treatment with EAF improved glucose tolerance and lipid profiles, but the insulin secretion was unaltered. Gene expression analyses on insulin/adipocytokine signalling-related genes demonstrated tissue-specific transcriptional responses. In skeletal muscle and liver tissues, *Socs1*, *Tnf* and *Mapk8* showed consistent transcript regulation. Furthermore, hepatic translational analyses revealed sensitization on proximal insulin signalling, with reduced expression of IRS1 serine phosphorylation, increased IRS1 tyrosine phosphorylation and increased phospho-AKT (Ser473). The present findings suggested that EAF exerted its effect by modulating insulin signalling, potentially via IRS1/AKT activation. The pharmacological attributes of EAF may implicate its potential therapeutic applications for diabetes management.

Keyword: Ethyl acetate fraction; Type 2 diabetes mellitus; Insulin resistance; Insulin signaling; IRS1/AKT activation