Solid-substrate Fermentation of Wheat Grains by Mycelia of Indigenous Ganoderma spp. Enhanced Adipogenesis and Modulated PPAR gamma Expression in 3T3-L1 cells

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Abstract
Adipocyte dysfunction is strongly associated with the progression of cardiovascular risk factors and diabetes. Appropriate regulation of adipogenesis and adipokine expression, notably adiponectin, are known to prevent or delay the onset of these disorders. The present study evaluated the insulin-like properties of ethanol extract of indigenous Ganoderma australe (KUM60813) and Ganoderma neo japonicum (KUM51076) through adipogenic, anti-lipolytic and adipogenesis targeted gene expression in differentiated 3T3-L1 adipocytes. Ganoderma lucidum (VITA GL) (a commercial strain) was included in the study as a reference. 3T3-L1 adipocytes treated with ethanol extract of wheat grains fermented with G. neo japonicum mycelia, significantly stimulated adipogenesis and exerted relatively mild anti-epinephrine induced lipolytic activities. In general, the expressions of target genes such as adiponectin, peroxisome proliferator-activated receptor gamma (PPAR gamma), glucose transporter 4 (GLUT4) and hormone sensitive lipase (HSL) were up-regulated by the ethanol extract of wheat grains fermented with Ganoderma spp. mycelia. Taken together, these results suggest that Ganoderma especially G. neo-japonicum has insulin-like properties and may be useful as potential therapeutic agent in the management of type 2 diabetes mellitus.

Keywords
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