

Insulinotropic properties of beta-glucans produced by submerged mycelial culture of a medicinal mushroom *Laetiporus sulphureus* var. *miniatus*

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In the present study, optimum culture conditions for the production of extracellular polysaccharides (EPS) in submerged culture of an edible mushroom, *Laetiporus sulphureus* var. *miniatus* and their stimulatory effects on insulinoma cell (RINm5F) proliferation and insulin secretion were investigated. The maximum mycelial growth (4.1 g/l) and EPS production (0.6 g/l) in submerged flask culture were achieved in a medium containing 30 g/l maltose, 2 g/l soy peptone, and 2 mM MnSO₄•5H₂O at an initial pH 2.0 and temperature 25°C. Interestingly, supplementation of deep sea water (DSW) into the culture medium significantly increased both mycelial biomass and EPS production by 4 and 6.7 fold at 70% (v/v) DSW medium, respectively. The EPS were proved to be glucose-rich polysaccharides and were able to increase proliferation and insulin secretory function of rat insulinoma RINm5F cells, in a dose-dependent manner. In addition, EPS also strikingly reduced the streptozotocin-induced apoptosis in RINm5F cells indicating the mode of the cytoprotective role of EPS on RINm5F cells.