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Hypoglycaemic Activity of Culinary *Pleurotus ostreatus* and *P. cystidiosus* Mushrooms in Healthy Volunteers and Type 2 Diabetic Patients on Diet Control and the Possible Mechanisms of Action

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This study determined the oral hypoglycaemic effect of suspensions of freeze dried and powdered (SFDP) *Pleurotus ostreatus* (*P.o*) and *Pleurotus cystidiosus* (*P.c*), using healthy human volunteers and Type 2 diabetic patients on diet control at a dose of 50 mg/kg/body weight, followed by a glucose load. The possible hypoglycaemic mechanisms were evaluated using rats, by examining intestinal glucose absorption and serum levels of insulin, glucokinase (GK) and glycogen synthase kinase (GSK). The *P.o* and *P.c* showed a significant reduction ($P < 0.05$) in fasting and postprandial serum glucose levels of healthy volunteers and reduced the postprandial serum glucose levels and increased the serum insulin levels ($P < 0.05$) of Type 2 diabetic patients. The *P.o* and *P.c* increased the intestinal absorption of glucose but simultaneously reduced the serum glucose levels ($P < 0.05$) in rats. Both mushrooms reduced the serum GSK and promoted insulin secretion while *P.c* increased serum GK ($P < 0.05$). The hypoglycaemic activity of *P.o* and *P.c* makes mushrooms beneficial functional foods in diabetes mellitus. The mechanism of hypoglycaemic activity of *P.o* and *P.c* is possibly by increasing GK activity and promoting insulin secretion and thereby increasing the utilization of glucose by peripheral tissues, inhibiting GSK and promoting glycogen synthesis. Copyright © 2014 John Wiley & Sons, Ltd.

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