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THE POSSIBLE MECHANISMS OF ORAL HYPOGLYCAEMIC ACTIVITY OF *PLEUROTUS OSTREATUS* AND *P. CYSTIDIOSUS*

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Pleurotus ostreatus and *P. cystidiosus* are culinary-medicinal mushrooms grown worldwide. We have reported the hypoglycaemic effect of suspensions of freeze dried and powdered (SFDP) *P. ostreatus* and *P. cystidiosus* in normal and alloxan-induced diabetic Wistar rats. According to previous findings, 500 mg/kg was identified as the maximally effective oral dose of SFDP *P. ostreatus* and *P. cystidiosus*. The possible mechanisms of oral hypoglycaemic activity of *P. ostreatus* and *P. cystidiosus* were investigated in the present study. Normal and alloxan-induced diabetic Wistar rats were used as animal models (n=6/group). Following an overnight fast, diabetic test groups were administered with a single dose (500 mg/kg) of SFDP *P. ostreatus* and *P. cystidiosus*. Diabetic control group was fed with distilled water. A glucose load of 3.0 g/kg body weight was administered to test and control groups 30 minutes after administering the suspension and water, respectively. Serum levels of insulin, glucokinase (GK), glycogen synthase kinase (GSK) and the glucose levels in serum and in the intestinal contents were measured 90 minutes after the glucose load. Blood for glucose analysis was collected into fluoridated tubes. In a subsequent experiment, three groups of normal rats were fasted overnight. Test 1, 2 and control groups were administered with *P. ostreatus*, *P. cystidiosus* and distilled water, respectively. Postprandial glucose levels in serum and in the intestinal contents were measured after a glucose challenge as above. There was a significant reduction in postprandial glucose levels in serum as well as in the intestinal contents of normal and diabetic test groups when compared with the respective control group (p<0.05) following a single dose of *P. ostreatus* and *P. cystidiosus*. In the experiment with diabetic rats, there was a significant increase in postprandial serum insulin levels of *P. ostreatus* and *P. cystidiosus* groups when compared with the control group (33% and 38%, respectively). Postprandial serum GK level of *P. cystidiosus* group was increased significantly by 23% when compared with the control group. Even though the GK level of *P. ostreatus* group was reduced, it was not statistically significant (P>0.05). Postprandial serum GSK levels of SFDP *P. ostreatus* and *P. cystidiosus* groups were reduced significantly when compared with the control group (26% and 12%, respectively). It could be postulated that *P. ostreatus* and *P. cystidiosus* may exert their oral hypoglycaemic activity via several possible mechanisms viz increasing GK activity and promoting insulin secretion and thereby increasing the utilization of glucose by peripheral tissues, inhibiting GSK and thereby promoting glycogen synthesis.

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