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Anti-diabetic effects of *Inonotus obliquus* polysaccharides in streptozotocin-induced type 2 diabetic mice and potential mechanism via PI3K-Akt signal pathway

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Abstract

Polysaccharides are the main components of mushroom *Inonotus obliquus* (*I. obliquus*) with antihyperglycemic activities. This study was aimed to investigate the anti-diabetic effects and the potential mechanism of *I. obliquus* polysaccharides (IOPS) in high fat diet and STZ-induced type 2 diabetic mice. Results showed that oral administration of IOPS (900mg/kg) could significantly restore the body and fat mass weight, reduce fasting blood glucose levels, improve glucose tolerance ability, increase hepatic glycogen level and ameliorate insulin resistance compared to those of the control diabetic mice ($P < 0.01$). IOPS (900mg/kg) could enhance the cholesterol transportation in the liver, which was in coincidence with the increased HDL-C levels and decreased TC, TG and LDL-C levels. Treatment of IOPS could significantly improve the antioxidant activities of liver ($P < 0.05$) and alleviate the STZ-lesioned organ tissues (liver, kidney, and pancreas). Further, protein expressions of PI3K-p85, p-Akt (ser473), GLUT4 were up-regulated after IOPS treatment, indicating that the antihyperglycemic mechanism of IOPS might involve in activating PI3K and Akt phosphorylation as well as the translocation of GLUT4 in diabetic mice. The results suggested that IOPS might be a promising functional food or drug candidate for diabetes treatment.

Keywords: Antihyperglycemic effects; *Inonotus obliquus* polysaccharides; PI3K-Akt signal pathway; Type 2 diabetic mice.

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