The Involvement of Serotonin in the Hypoglycemic Effects Produced by Administration of the Aqueous Extract of Xylaria nigripes with Steroid-Induced Insulin-Resistant Rats

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ABSTRACT

Xylaria nigripes (XN) is a medicinal fungus with a high-economic value. The aim of this study was to explore the hypoglycemic effects and mechanisms of the XN aqueous extract in steroid-induced insulin-resistant (SIIR) rats. Significant hypoglycemic effects were observed 60 min after administration of XN aqueous extract. In normal Wistar, hypoglycemic effects were 21% (the plasma glucose level decreased from 128.6 ± 12.5 to 100.9 ± 10.7 mg/dL). In SIIR, hypoglycemic effects were 26% (the plasma glucose level decreased from 177.6 ± 12.5 to 133.3 ± 29.7 mg/dL) rats refer to their baseline. The signaling proteins for insulin-receptor substrate-1 and glucose transporter-4 increased 0.51-fold and 1.12-fold, respectively, as determined by Western blotting; the increase in the proteins was 13% and 9%, respectively, as determined by immunohistochemistry. The serotonin antagonist, α-p-chlorophenylalanine, effectively blocked the hypoglycemic effects and increased the signaling protein levels. After XN administration, none of the animals showed significant changes in plasma-free fatty acids in 60 min. In summary, the XN extract may have hypoglycemic effects in normal Wistar and SIIR rats that may have a serotonin-related hypoglycemic effect and enhance insulin sensitivity in the SIIR rats.

Keywords: XN, Xylaria nigripes; 5-HT, 5-hydroxytryptophan; SIIR, steroid-induced insulin-resistant; IHC, immunohistochemistry

REFERENCES


