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Mechanisms behind hypoglycemic actions of butanol fraction of *Azadirachta indica* in a type 2 diabetes rat model

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The cost and side effects of oral hypoglycemic agents for the treatment and management of type 2 diabetes (T2D) has led to increase the use of natural medicines, particularly from medicinal plants. Hence the validation of the folkloric and use of these medicinal plants. In the present study, the mechanisms behind the antidiabetic effects of the butanol fraction of *Azardirachta indica* (*A. indica*) (BFAI) were evaluated. T2D was induced by feeding 10% fructose solution ad libitum for two weeks followed by an intraperitoneal injection of streptozotocin (40 mg/kg body weight) and the animals were treated with a low dose (150 mg/kg) and a high dose (300 mg/kg) of BFAI for 4 weeks as a single oral dose daily. Body weight and blood glucose were determined every week. Oral glucose tolerance test was performed in the

last week of treatment. Insulin homeostasis and liver glycogen concentration were determined after 4 weeks of oral administration. Both doses of the fractions showed significant improvement of body weight, reduced blood glucose, stimulated insulin secretions, improved pancreatic β - cell function (HOMA- β), decreased insulin resistance (HOMA-IR) and increased liver glycogen concentration compared to untreated diabetic rats, when high dose had a better activity. GC-MS analysis of the fraction revealed the presence of polyphenols. The results of this study suggest that, the polyphenols present in the fraction may be responsible for the antidiabetic effects which have been achieved via decreasing insulin resistance, modulating β -cell function, as well as by inhibiting of α -amylase and α -glucosidase activity.