



# Effect of stevia aqueous extract on the antidiabetic activity of saxagliptin in diabetic rats

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## Abstract:

**Ethnopharmacological relevance:** Stevia rebaudiana Bertoni is a perennial herb that belongs to the Asteraceae family. It is a natural sweetener plant known as "Sweet Leaf", "Sweet Herbs" and "Honey Leaf", which is estimated to be 300 times more sweetening than sugar cane. Stevia has been used as a traditional treatment for diabetes in many countries for hundreds of years. Several animal studies referred to the antihyperglycemic activity of stevia. However, the combined use of stevia with saxagliptin has not been studied so far, so this study has been done. The aim of the present study was to evaluate the antihyperglycemic effect of stevia alone and in combination with saxagliptin. **Materials and methods:** Diabetes was induced in rats by i.p. injection of streptozotocin and nicotinamide. Animals were divided into five groups, each contains eight rats. Group I: included negative control and group II: included diabetic control that received saline. Group III: included diabetic rats that received 400 mg/kg/day stevia aqueous extract. Group IV: included diabetic rats that received saxagliptin 10 mg/kg/day. Group V: included diabetic rats that received stevia 400 mg/kg + saxagliptin 10 mg/kg. Food and water intake were measured daily while body weight was measured weekly. After 3 weeks animals were sacrificed and blood and tissue samples were collected. Fasting blood glucose (FBG), serum insulin, serum dipeptidylepeptidase-4 (DPP-4), TC, TGs, LDL, HDL, GSH and MDA were measured in treated and control rats by colorimetric and ELISA methods. **Results:** Both stevia and saxagliptin significantly reduced food, water intake, body weight and FBG. Stevia with saxagliptin produced more significant decrease in FBG. While serum insulin increased significantly in stevia, saxagliptin treated groups and their combination. Serum DPP-4 decreased significantly in all treated groups, concerning lipid profile, stevia and saxagliptin notably lowered TC, TGs, and LDL and increased HDL. Both stevia and saxagliptin remarkably decreased MDA and increased GSH compared to diabetic rats. In addition, stevia significantly improved the antidiabetic effects of saxagliptin. **Conclusion:** Stevia has an antihyperglycemic effect and could enhance the antidiabetic activity of saxagliptin. DPP-4 attenuation, antihyperlipidemic and antioxidant activity as well as improvement of insulin sensitivity may be involved in the antidiabetic action of stevia.

## Keywords:

Diabetes mellitus Stevia Saxagliptin DPP-4 STZ and Nicotinamide

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