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Garlic extract reduces serum angiotensin converting enzyme (ACE) activity in nondiabetic and streptozotocin-diabetic rats.

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The rennin-angiotensin system (RAS) has been implicated in the development of diabetic vascular complications. Peptidyl-dipeptidase A (angiotensin converting enzyme, ACE) has a major role in this system. The aim of the present study was to clarify the effect of intraperitoneal administration of aqueous garlic extract (*Allium sativum*) on the serum ACE activity of streptozotocin (STZ)-diabetic and nondiabetic rats. Although garlic extract administration had no significant effect on serum glucose, it significantly strongly decreased the serum ACE activity. ACE activity was higher in diabetic than nondiabetic rats, but in diabetic animals treated with garlic extract, the elevation of ACE activity did not occur. These results suggest that garlic extract might have value as ACE inhibitor to prevent some vascular complications of diabetes mellitus.

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- Phytomedicine. 2006 Nov;13(9-10):624-9. Epub 2005 Nov 2

Antidiabetic effect of garlic (*Allium sativum* L.) in normal and streptozotocin-induced diabetic rats.

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OBJECTIVE: The antidiabetic effect of garlic ethanolic extract (*Allium sativum* L.) was investigated in normal and streptozotocin-induced diabetic rats. **RESEARCH METHODS AND PROCEDURE:** In the present study, oral administration of garlic extract (0.1, 0.25 and 0.5 g/kg body wt.) for 14 days on the level of serum glucose, total cholesterol, triglycerides, urea, uric acid, creatinine, aspartate amino transferase (AST) and alanine amino transferase (ALT) in normal and streptozotocin-induced diabetic rats were evaluated. **RESULTS:** Oral administrations of the garlic extract significantly decreased serum glucose, total cholesterol, triglycerides, urea, uric acid, creatinine, AST and ALT levels, while increased serum insulin in diabetic rats but not in normal rats ($p < 0.05$). A comparison was made between the action of garlic extract and glibenclamide (600 microg/kg), the known antidiabetic drug. The antidiabetic effect of the extract was more effective than that observed with glibenclamide. **CONCLUSION:** It is concluded that the plant must be considered as excellent candidate for future studies on diabetes mellitus.

Publication Types: Research Support, Non-U.S. Gov't

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Effect of fenugreek, onion and garlic on blood glucose and histopathology of pancreas of alloxan-induced diabetic rats.

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BACKGROUND: Many traditional treatments have been recommended in the alternative system of medicine for treatment of diabetes mellitus; however, the mechanism of most of the herbals used has not been defined. **AIMS:** This study was carried out to clarify the effect of fenugreek, garlic and onion, recommended in Persian folklore medicine as beneficial in the treatment of diabetes, on blood glucose and their possible effect on pancreatic tissue. **METHODS AND MATERIAL:** Diabetes mellitus was induced in 20 out of 25 adult

male albino rats, using intraperitoneal injection of 185 mg/kg BW alloxan. The diabetic rats were divided into four groups, three of which were fed a diet containing 12.5% BW *Allium sativum* (garlic), *Allium cepa* (onion) or *Trigonella foenum-graecum* (fenugreek) for 15 days. The fourth group (positive control) received an ordinary diet. The remaining non-diabetic rats (negative control group) received neither alloxan nor the mentioned plants. Following consumption of plants, blood glucose was measured every day and on the last day the pancreas were removed and stained with H&E and Gomori aldehyde fuchsin (GAF). Morphology of the pancreatic sections and the following morphometric factors were studied: volume density of B cells, volume density of islets, percent of B cells, number of islets per square millimeter, average area of islets and average volume density of B cell in whole pancreas. STATISTICAL ANALYSIS USED: One-way Analysis of Variance (ANOVA) test and Duncan's multiple range tests were used to evaluate the data. RESULTS AND CONCLUSION: The results of this study indicate that only garlic was able to reduce blood glucose significantly compared with the control group ($P < 0.05$). In the control positive group all the mentioned morphometric factors were significantly changed in comparison with the control negative (normal health) group, but the same did not show significant change between treated and untreated diabetics.

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Biochemical study on the hypoglycemic effects of onion and garlic in alloxan-induced diabetic rats.

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The present study was carried out to investigate the effects of onion (*Allium cepa* Linn) and garlic (*Allium sativum* Linn) juices on biochemical parameters, enzyme activities and lipid peroxidation in alloxan-induced diabetic rats. Alloxan was administered as a single dose (120 mg/kg BW) to induce diabetes. A dose of 1 ml of either onion or garlic juices/100 g body weight (equivalent to 0.4 g/100 g BW) was orally administered daily to alloxan-diabetic rats for four weeks. The levels of glucose, urea, creatinine and bilirubin were significantly ($p < 0.05$) increased in plasma of alloxan-diabetic rats compared to the control group. Aspartate aminotransferase (AST), alanine aminotransferase (ALT), lactate dehydrogenase (LDH), and alkaline and acid phosphatases (ALP, AcP) activities were significantly ($p < 0.05$) increased in plasma and testes of alloxan-diabetic rats, while these activities were decreased in liver compared with the control group. Brain LDH was significantly ($p < 0.05$) increased. The concentration of thiobarbituric acid reactive substances and the activity of glutathione S-transferase in plasma, liver, testes, brain, and kidney were increased in alloxan-diabetic rats. Treatment of the diabetic rats with repeated doses of either garlic or onion juices could restore the changes of the above parameters to their normal levels. The present results showed that garlic and onion juices exerted antioxidant and antihyperglycemic effects and consequently may alleviate liver and renal damage caused by alloxan-induced diabetes.

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