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Antihyperglycemic and hypolipidemic activity of ethanolic extracts of *Hiniscus rosa-sinensis* in type 2 diabetic rats

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Hibiscus rosa-sinensis (HRS) has formerly demonstrated anti-hypoglycemic activity in type 2 diabetic rats. However, study on organ and tissue level has not been done yet. Our study is to find out, whether the antidiabetic activity is the result of inhibition of the action of gastrointestinal enzyme or decrement glucose absorption. For the investigation of hypoglycemic activity at primary stage, we studied fasting blood glucose and measured glucose tolerance test, in type 2 diabetic rats. Serum glucose, lipids, plasma insulin, insulin level in pancreases and hepatic glycogen content were assayed in this study. Sucrose malabsorption was evaluated in the six different parts of GI tract. Effect of extract on glucose absorption in the gut was studied by an *in situ* intestinal perfusion technique. The extract showed significant ($p < 0.05$) anti-hyperglycemic activity at fasting as well as postprandial state in the glucose-fed type 2 diabetic rats at 120 min and 240 min. During sucrose malabsorption test, unabsorbed sucrose content in gut was found to be higher in comparison to control and this test was confirmed by *in situ* intestinal perfusion technique, where extracts remarkably inhibited the glucose absorption in GIT tract. In chronic study, HRS significantly decreased serum glucose ($P < 0.05$), Cholesterol ($P < 0.05$), TG ($P < 0.01$) and increased HDL ($P < 0.01$) and the hepatic glycogen ($P < 0.05$) without significant increase in body weight and enhanced circulating insulin. Hypoglycemic activities of HRS in type 2 diabetic rats were mediated by decrease in carbohydrate absorption from the gut. This combination of *in vitro*, *in vivo* and *in situ* tests established the anti-hyperglycemic activity of *H. rosa-sinensis* and its tissue oriented mechanism.

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Influence of music on diabetes

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Influence of music on blood sugar levels was studied among fifty diabetic patients (60-75 years) randomly selected from a diabetic clinic. Training on diet, exercise, medicines and how to monitor blood sugar levels is existing. In addition they were asked to listen to music of their choice for half an hour daily for three months. Patients were monitored and monthly readings recorded. Twenty five diabetic patients (60-75 years) with similar routine selected as control group were not exposed to music. Initial fasting glucose levels in both groups ranged between 100 – 180 mg/dl, average being 154 mg/dl in the experimental group and 152 mg/dl in the control group. In the experimental group Initial fasting blood sugar levels were - 20%, 28%, 16% and 36% in ranges 100-120, 121-140, 141-160, >161 respectively. After three months blood sugar levels decreased with 28% sliding into normal range. Patients with 100-120 mg/dl were 20%, 121-140-24%, 141-160 - 4%, > 160 mg/dl - 24% respectively. In the control group initial readings at 100- 120, 121--140, 141-160, >161 mg/dl are 32%, 48%, 12% and 8 percent. While final readings were 28%, 64%, 4% and 4% respectively. None were in the normal range. Music seemed to have influenced the blood sugar levels, probably by decreasing the stress factor. Several patients exposed to music looked relaxed, steady and happy. While in the control group though they followed a prescribed therapy of medicines, diet and exercise, sugar levels fluctuated but did not touch the normal level.

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