



**CALIFORNIA STATE SCIENCE FAIR  
2012 PROJECT SUMMARY**

<b>Name(s)</b> <b>Mythri Ambatipudi</b>	<b>Project Number</b> <b>J1702</b>
<b>Project Title</b> <b>Bitter-Sweet Therapy: Hypoglycemic Effects of Bitter Melon and Fenugreek on Type 2 Diabetes Mellitus</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> About 80% of deaths resulting from Diabetes Mellitus occur in under-developed countries where modern hypoglycemic drugs are either unaffordable or inaccessible. Herbs such as Momordica Charantia, or Bitter Melon, and Trignoella Foenum-Graecum, or Fenugreek, are becoming popular remedies in such countries although their hypoglycemic effects are unproven. The objective of this project is to test the hypoglycemic effects of these herbs and find an alternative remedy for type 2 diabetes.</p> <p><b>Methods/Materials</b> Informed consent was obtained from 10 type 2 diabetic and 10 non-diabetic human subjects. The blood glucose levels after 12 hours of overnight fasting as well as 1 hour, 2 hours and 3 hours after breakfast were measured for all the subjects for a period of 3 days. The experiment was then repeated for a period of 12 more days with the subjects consuming 60mL and 120mL of bitter melon juice and 1tsp. and 2tsp. of fenugreek powder along with the breakfast. The subjects maintained a consistent lifestyle and ate the same breakfast every day and the diabetic subjects continued their regular diabetic medication during the test period.</p> <p><b>Results</b> Fenugreek lowered the blood glucose levels of 18 out of 20 subjects and bitter melon lowered the blood glucose levels of 17 out of 20 subjects. Type 2 diabetic subjects experienced improved body metabolism and reduced blood glucose levels with these herbs. Two type 2 diabetic subjects who experience high blood glucose levels due to the side effects of cholesterol lowering statins experienced reduced blood glucose levels with these herbs.</p> <p><b>Conclusions/Discussion</b> Ingredients in bitter melon such as charantins, polypeptide-P and alkaloids improve glucose absorption and body metabolism. Ingredients in fenugreek such as the 4-hydroxyisoleucine amino acid, the trigonelline alkaloid and fenugreekine increase the number of insulin receptors, improve glucose utilization by peripheral tissues and improve body metabolism. The results from this experiment show that type 2 diabetic patients may use these herbs to control their diabetes. Non-diabetic people should use these herbs to lower their chances of developing diabetes.</p>	
<b>Summary Statement</b> The objective of this project is to investigate the hypoglycemic effects of Momordica Charantia (Bitter Melon) and Trigonella Foenum-Graecum (Fenugreek) and find an alternative remedy for type 2 diabetes.	
<b>Help Received</b> Mrs. Svjetlana Dubocanin, a DM nutrition and prevention expert, and Mrs. Neha Makhijani, my project advisor, provided guidance on diabetes related research. My parents purchased all the material and provided transportation.	