

## Alpha-amylase in fermented deglycyrrhizinated liquorice for treatment of complications of diabetes mellitus Diabetus Mellitus

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### Abstract

Diabetes Mellitus (DM) dramatically increases the risk of various complications which include vascular, neuropathic, nephropathic, cataract, and retinopathy among many other complications. A novel approach for treating diabetic complications is fermented deglycyrrhizinated liquorice which contains alpha-amylase as well as flavonoids. Many diabetics, both in type1 and type 2DM, lack amylase. Liquorice prepared by fermentation (Prof. Massoud European patent No. EP 1 925 312 B1) is rich in alpha-amylase which improves diabetic complications due to increase in cellular enzymatic activity and energy production, probably by enhancing glycolysis and citric acid cycle. Opening the gate for glycolysis will prevent glucose accumulation and sorbitol formation which would produce tissue damage. Flavonoids, on the other hand, prevent the transformation of glucose to sorbitol by inhibiting aldose reductase enzyme augmenting the effect of amylase. Besides, flavonoids have potent antioxidant action preventing oxidative stress produced by the activated polyol pathway in DM. Oxidative stress is responsible for many diabetic complications. This novel drug was prepared by fermentation of liquorice followed by getting rid of glycyrrhizin using hydrochloric acid instead of boiling; for fear of destruction of the enzymes and flavonoids. This novel treatment for diabetic complications was accepted by the European patent committee (Patent No. EP 1 925 312 B1).

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