

Korean herbal tea, *Diospyros kaki* Thunb, a potent α -glucosidase inhibitor and antioxidant, alleviates postprandial hyperglycemia in normal and diabetic rats

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Objectives

We investigated the α -glucosidase inhibitory potential of *Diospyros kaki* T. leaf extract (DKLE) along with its antioxidant activity against metal-catalyzed protein oxidation *in vitro*. DKLE evidenced outstanding inhibitory effect against α -glucosidase from bakers yeast and rat intestinal acetone powder with IC₅₀ values of 1.22 μ g/ml and 32 μ g/ml, respectively. The inhibition mode of this extract for both enzyme sources found to be noncompetitive. The addition of Fe²⁺/ascorbate to the liver homogenate significantly increased the extent of protein oxidation, which was significantly lowered with the extract treatment. Also DKLE ability to alleviate postprandial hyperglycemia in normal and diabetic rats was scrutinized. Oral administration of this extract considerably decreased blood glucose levels (BGLs) in normal and diabetic rats after glucose and maltose loading in dose-dependent manner. These results propose that DKLE might show an anti-diabetic effect by suppressing carbohydrate and glucose absorption from the intestine and can reduce the postprandial blood glucose rise.

Materials and methods

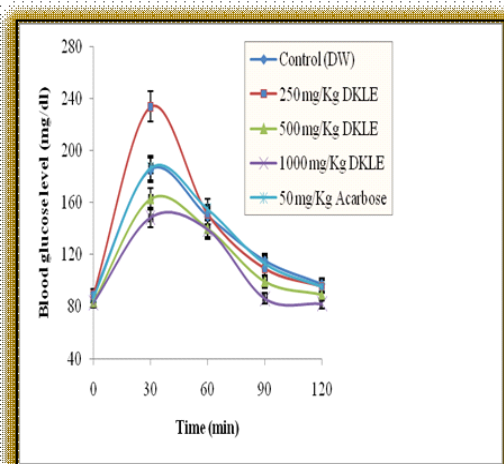
- Animals: Healthy male rats (190-240 g)
- DKLE preparation : The leaves (4 kg) extracted with 80% MeOH for 3 days, dried and lyophilized.
- Determination of antidiabetic and antioxidant potential *in vitro*
- α -glucosidase inhibitory potential
- Bakers yeast
- Rat intestinal acetone powder
- Animal experiment (OGTT on normal and diabetic rats)_
- After glucose load (1g/kg bw) and after maltose load (1g/kg bw)
- Reference standard: Acarbose
- Lipid peroxidation assay on rat liver homogenate (oxidative stress generation by Fe²⁺/ascorbate)
- Reference standard: Quercetin

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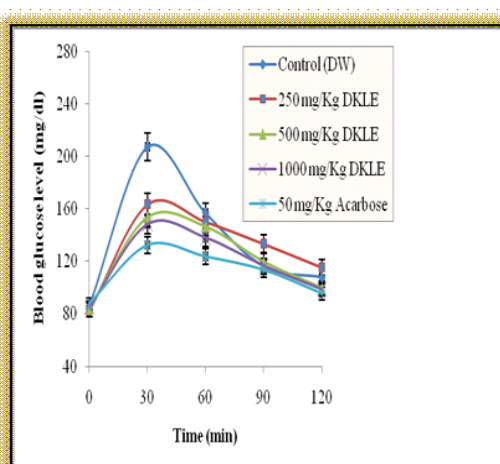
Results

α -glucosidase inhibitory activity: Enzyme source	IC ₅₀ value ($\mu\text{g/ml}$)		Type of inhibition for DKLE
	DKLE	Acarbose	
Bakers yeast	1.22	133	Non-competitive
Rat intestinal acetone powder	32	10.7	Non-competitive

DKLE effects on BGLs in normal rats after:

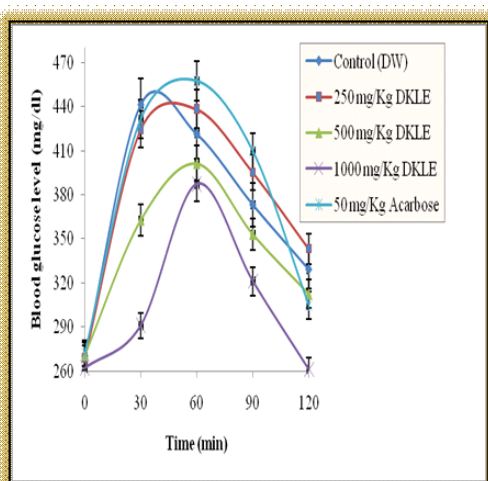


Glucose load

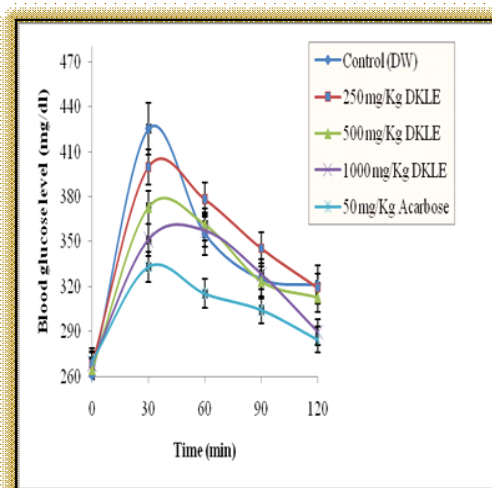


Maltose load

DKLE effects on BGLs in diabetic rats after:



Glucose load



Maltose load