



Comparative diuretic activity of seed and Fruit wall extract of *Solanum torvum*

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Abstract

The Pharmacognostical and phytochemical examinations of methanol extracts of seeds and fruit wall of *Solanum torvum* were conducted and their diuretic activity was evaluated in albino rats. The administration of methanol extracts of seed and fruit wall of *Solanum torvum* by oral route at doses; 150,300 and 450 mg/kg body weight. After 5 hr the volume of urine is measured. Results revealed that the fruit wall methanol extract showed significant diuretic activity comparative to seed methanol extract and concentrations of potassium & sodium salts in urine as compared to standard drug Furosemide.

Keywords: *Solanum torvum*, Methanol, Furosemide, diuretic activity.

1. Introduction

Diuretics are the drugs capable of increasing the rate of urine flow and sodium excretion and are used to adjust the volume and composition of body fluids in a variety of clinical situations, including hypertension, heart failure, renal failure, nephritic syndrome and cirrhosis. These drugs act on the kidney and are able to increase the volume of urine excretion. The urine output increases after administration of diuretic drugs like furosemide [1]. *Solanum torvum* (*Solanaceae*) popularly known as Sundaikai, Kodusonde in India, is used in the treatment improving the eyesight and treatment of spleen and liver enlargement, anti microbial agent and the plant is considered sedative, diuretic and digestive. [2, 3].

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Since the diuretic activity of this plant has not been scientifically evaluated, the present study was undertaken to investigate the effect of methanolic extracts of seed and fruit wall of *Solanum torvum* for its diuretic activity with their electrolyte excretion.

2. Materials and methods

2.1. Plant material

The Fruits of *Solanum torvum*. (Solanaceae) were collected in September and October 2007 from Thirumala Thirupathi (A.P), India. The plant parts are identified by Dr. Madhavashetty, Taxonomist, Dept of Botany, S.V University and Thirupathi, India and authenticated by comparing with the voucher specimen.

2.2. Extraction

The Seed, fruit wall are separated, dried and powdered and macerated with methanol for 2 days to afford a greenish brown semisolid mass (Seed methanol extract; yield: 6.76% w/w on dried wt, Fruit wall methanol extract; yield:7.12% w/w on dried wt,).

2.3. Preliminary phytochemical studies

Preliminary qualitative phytochemical analysis of Seed methanol extract and Fruit wall methanol extract indicated the presence of spirostanol glycosides, isoflavanoids, alkaloids, tannins and carbohydrates.

2.4. Animals

Wistar rats of either sex, weighing 180-240 g purchased from NIN, Hyderabad were used. They were housed in standard environmental conditions of temperature, humidity, light and provided with standard rodent food and water *ad libitum*

3. Diuretic Activity

The Wistar rats were divided into eight groups of six animals each. Group I served as control and received normal saline orally. Group II served as positive control and received Furosemide (20 mg/kg). Group III, IV and V received Seed methanolic extract, orally at a dose of 150, 300 and 450 mg/kg respectively. Group VI, VII and VIII received Fruit wall methanolic extract, orally at a dose of 150, 300 and 450 mg/kg respectively.

Immediately after administration, the animals were placed in metabolic cages specially designed to separate urine and faeces at room temperature of $25 \pm 0.5^\circ$.

The observed parameters were total volume Na⁺, K⁺ and Cl⁻ excreted in the urine. The concentration of Na⁺ and K⁺ were measured by flame photometer and Cl⁻ concentration was estimated by titration with silver nitrate with silver nitrate solution (N/50) using 3 drops of 5% potassium chromate as an indicator. [6, 7] Data are presented as Mean ± SEM.

4. Statistical analysis

Statistically, the values were analyzed with the analysis of variance (one way ANOVA) method to determine the significance of difference within the experimental groups.

5. Results and Discussion

The data showed that, the fruit wall methanolic extracts of *Solanum torvum* produced significant diuretic activity, evidenced by the increased excretion of sodium and potassium salts, comparable to the standard drug, furosemide. Hence we concluded that the fruit wall methanolic extracts of *Solanum torvum* showed effective diuretic activity by increasing the total urine output and increased excretion of sodium and potassium salts. Further research is warranted to evaluate the exact mechanism and chemical compounds responsible for this activity.

Table-1 Diuretic activity of seed and fruit wall extracts of *Solanum torvum*

Name of the drug/extracts	Dose (mg/kg)	volume of urine in ml (Mean ± SEM) After 5 hrs	Electrolyte excretion		
			Na ⁺	K ⁺	Cl ⁻
Control	-	0.6±0.04	64	12.2	52
Standard (furosemide)	20	3.2±0.44	102	13.1	112
Seed methanol	150	0.9±0.13	72	12.2	76
	300	1.2±0.06	56	12.5	64
	450	1.4±0.13	84	13.1	81
FruitWall methanol	150	1.7±0.04	98	12.5	87
	300	2.0±0.02	114	12.8	104
	450	2.3±0.13	125	13.0	101

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