DIURETIC ACTIVITY OF THE EXTRACT OF *VITIS INDICA*

J. Anbujeba Sunilson\(^1\) R. Venkatenarayanan\(^1\)
A. Thangathirupathi\(^1\), DR.A. Saraswathi\(^2\), M. Praveen\(^1\)
A.V.Anithagnanakumari\(^3\)

1. Department of Pharmacognosy and Phytochemistry S.B. College of Pharmacy, Sivakasi
2. Captain Sreenivasa Murthy Drug Research Institute for Ayurveda, Arumbakkum, Chennai
3. Centre of Marine Science and Technology, M.S. University, Rajakamangalam, Kanyakumari.

Received : 10-1-2004 Accepted : 14-2-2004

**ABSTRACT**: Aqueous and alcoholic extracts of *Vitis indica* were tested for diuretic activity in rats. The parameters studied on individual rats were body weight before and after test period, total urine volume, urine concentration of Na\(^+\), K\(^+\) and Cr. In the present study, alcoholic and aqueous extracts of *Vitis indica* leaves (200 mg/kg body weight) shows increase in urine volume, cationic and anionic excretion. Fruosemide (100 mg/kg body weight) is used as a standard.

**INTRODUCTION**

*Vitis indica* (Family-VITACEAE) is traditionally used as diuretic (1). It is also used in the treatment of bronchitis and gonorrhoea (2). The present investigation is taken into consideration because no systematic studies have been reported for the diuretic activity of aqueous and alcoholic extracts of *Vitis indica*.

**MATERIALS AND METHODS**

Fresh leaves of *Vitis indica* were collected in the month of March 2002 from Tirunelveli district in Tamil Nadu and dried. 500 gms of dried and powdered leaves were extracted with alcohol in soxhlet apparatus for 24 hrs. A dark green colour residue was obtained, after concentrating the extract under reducing pressure (Yield 8.3%). The aqueous extract was obtained by maceration of 500 gms of powdered *Vitis indica* with 3 litres of distilled water for 72 hrs. The extract was filtered and concentrated under reduced pressure to obtain a green colour residue. (yield 15.2%).

**SCREENING OF RATS FOR DIURETIC ACTIVITY**

Male rats (Wistar Albino strain) 160 to 200 gms body weight supplied from Animal House, S.B. College of Pharmacy, Sivakasi, were used. The animals were maintained under standard conditions of temperature and humidity. The method of Lipschitz et al. (3) was employed for the assessment of diuretic activity. Four groups of 6 rats, 160 to 200 gms body weight, were fasted and deprived of water for 18 hrs prior to the experiment. On the day of experiment, animals were given normal saline orally (26 ml / kg of body weight) in which the alcoholic and aqueous extract were dissolved. Control animals received saline only. Immediately after dosing, the rats were placed in metabolic cages, 3 in each cage specially designed to separate urine and faeces. Animals were kept at room temperature of 25\(\pm\) 0.5\(^{\circ}\)C, throughout the experiment. The urine was collected in a measuring cylinder up to 5 hrs after dosing. During this period, no food or water was made available to animals. The total
volume or urine collected was measured for both control and treated groups. The parameters taken for individual body weight of rat (before & after test period), total urine volume, urine concentration of Na\(^+\), K\(^+\) Cl were applicable. Sodium and potassium concentration were measured by flame photometer (4) and calcium concentration were estimated by titration with silver nitrate solution (N/50) using 1 drop of 5% potassium chromate solution as indicator. Furosemide sodium salt (5) was given by stomach tube. Optimal dose activity relation was found to be 100 mg Furosemide/kg body weight in a series of supportive experiments.

Results are reported as mean S.D. The test of significance (p<0.001) was statistically analysed using student “t” test (6).

RESULTS DISCUSSION

Present study shows that the aqueous and alcoholic extracts of *Vitis indica* leaf possess excellent diuretic activity. Urine volume, cationic and anionic excretion were increased. Na\(^+\) /K\(^+\) ratio is reported to be increased. The concentration of aldosterone is found to be dependent on Na\(^+\) and K\(^+\) ratio. If the Na\(^+\) and K\(^+\) ratio falls below the normal in the plasma, the aldosterone secretion will be decreased and if the ratio rises above the normal value, the aldosterone secretion will be increased (7), Significant increases in Na\(^+\), K\(^+\) and Ca\(^+\) ions excretion was observed in aqueous and alcoholic extract treated rats but it was less than the Furosemide control.

Further studies are required to reveal the medicinal value of leaf of *Vitis indica* as a potent diuretic agent.

ACKNOWLEDGEMENT

The authors are grateful to management, S.B. College of Pharmacy, Sivakasi 626 130, India for providing the necessary infrastructure to carry out this research work in a successful manner.

REFERENCE

1. Warrier, P.K., V.P.K., Ramankutty, C, “ Indian Medicinal Plants”, Oriental Longman Ltd., Chennai - 5, 396-403 (1996).

2. Kirtikar, K.R, Basu. B.D., “ Indian Medical Plants”, International Book Distributors, Rajpur Road, Dehradun, India, Vol (1), 609-610 (1995)

3. Lipschitz, W.L., Hadidian, Z. and Kerpscar A., J., “Pharmcol Exp. Ther”, 79-97 (1943).

4. S. Kavimani, R. Ilango, J.G., Thangadurai, B.Jaykar, U.K.Majumdar and Malaya Gupta, Indian Journal of Pharmaceutical Sciences, Vol (59), 96, (1997). 

5. Goldenthal E.I., *Toxicol, Appl. Pharmacol* (18) 185 (1971).

6. “Remington’s Pharmaceutical Sciences” 18th Edition, Mack Publishing Company, Easton, Pennsylvania, 18042, 114-120.

7. Notowidjojo.L., and Truswell A.S., Asia Pacific J.Clin. Nutr., Vol (2), 25-33(1993).
Table 1: Diuretic activity of extracts of Vitis indica leaves on rats

| Treatment          | Dose mg/kg | No. of Rats used | Urine volume (ml) | Electrolyte Excretion | Total Chloride µ moles / Kg |
|--------------------|------------|------------------|-------------------|------------------------|-----------------------------|
| Control Saline     |            | 6                | 2.30 ± .16        | 1868 ± 38             | 629 ± 83                    |
| Aqueous Extract    | 100 mg/kg  | 6                | 4.50.95*          | 2985 ± 48*            | 191 ± 32*                   |
| Alcoholic Extract  | 100 mg/kg  | 6                | 3.9 ± 0.50        | 1211 ± 10             | 2272 ± 91                   |
| Furnosemide        | 100 mg/kg  | 6                | 5.9 ± 0.81        | 1736 ± 16             | 2775 ± 37                   |

The values are expression of the Standard error. *P<0.01 Vs. control