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DIURETIC ACTIVITY OF THE LEAVES OF *BUTEA FRONDOSA*

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ABSTRACT

The aqueous and ethanolic extract of leaves of Butea*frondosa* was evaluated for diuretic activity. Both extracts were evaluated by determination of urine volume and electrolyte concentration in albino rats. Results revealed that both the aqueous and ethanolic extract at dose 500mg/kg showed significant diuretic activity by increasing the total volume of urine and concentration electrolyte. Furosamide (10mg/kg) was used as reference drug while normal saline (0.9%) solution was used as control.

KEYWORDS: Buteafrondosa, Diuretic activity, Furosamide

INTRODUCTION

The botanical name of palasa is *Buteafrondosa*, belongs to family Fabaceae [1]. The skin of the bark and resin contains tannic and gallic acids. The plant gives a resin gum, called as Kino oil, proteolytic and lipolytic enzymes, palasonin, sitosterol, amyrin, monospermin, lectins and lactone. The alkaloid palasonin–from the seeds, is effective as an anthelmintic, especially in round worm infestations. (Ascarislumbricoides). Synthesis of a coumaranoneglucosidepalasitrin from the plant palasonin from the seeds Glycerides of palmitic. Lignoceric, oleic and linoleic acids from seeds oil isolated. A new alkaloid – monospermin – isolated of butrin and isobutrin from flower [2-4]. Palasa is pungent, bitter and astringent in taste, pungent in the post digestive effect and has hot potency. It alleviates kapha and vatadosas. But aggravates the pitta dosha; the gum is astringent, antidiarrhoeal, the seeds purgative, vermicidal and the flowers are astringent, diuretic. It is used in the diseases like worms, wounds colitis, piles, edema and anal diseases. Internally, palasa is useful in vast range of diseases. In diarrhea, dysentery and colitis, first the decoction of its fruits by itself or with hot milk is given to cleanse the bowels. Followed by the gum powder with hot water, for prompt astringent or anti-diarrhoeal action. Palasa helps for healing the intestinal ulcers. The flowers are useful in fever, thirst and diarrhea. In worm infestations, the powder of seeds is given along with honey [5]. The present investigation was undertaken to confirm traditional medicinal use of the plant.

MATERIALS AND METHODS

Plant material

The plant material was collected from the plantation in the Medicinal Garden, School of pharmacy, Devi AhilyaVishwavidhyalaya, Indore. The plant material was identified by a botanist, Dr. A. B. Sheerwani (Retd. Prof. and Head), Department of botany, Holkar Science College, Indore, and their voucher specimens were deposited in the Department of Pharmacognosy (No.C-26/HF), School of Pharmacy, Devi Ahilya Vishwavidhyalaya, Indore.

Extraction

The leaves were washed properly and cut into small pieces before being subjected to cold maceration for seven days. The solvents used for aqueous and alcoholic extraction were distilled water and 90% v/v ethanol in distilled water respectively. After seven days, the aqueous and alcoholic macerates were filtered through muslin cloth and concentrated using a rotary evaporator and dried in desicator.

Animals

Male Wister rats (150-200g) were obtained from the experimental animal house, School of life science, Devi Ahilya University, Indore. They were maintained under standard housing condition. The animals were given standard laboratory feed and water *ad libitum*. The study was cleared by Animal ethics committee. All the animals received humane care according to criteria outlined in the guide for the care and use of laboratory animals prepared by the national academy of the sciences and published by national institute of health.

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Acute toxicity

Acute toxicity study was carried out according to Miller and Tainter methods in albino mice of either sex (wt.20-25gm.) were used [6]. The LD_{50} dose of both aqueous and ethanolic extract of leaves of *Buteafrondosa* in mice was found 500 mg/kg.

Evaluation of diuretic activity

The method of Lipschitz*et al*. [7] was employed for the assessment of diuretic activity. In this method, male rats weighing between 150-200 g, deprived of food and water for 18 h prior to the experiment were divided in four groups of six rats in each. The first group of animals, serving as control, received normal saline (25 ml/kg, p.o.); the second group received furosamide (10 mg/kg, p.o.) in saline; the third and fourth groups received the aqueous and ethanolic extract at dose 500 mg/kg, in normal saline. Immediately after administration, the animals were placed in metabolic cages (2 per cage), specially designed to separate urine and faeces, kept at room temperature 25±0.5°. The volume of urine collected was measured at the end of 5 h. During this period, no food and water was made available to animals. The parameters taken were the body weight before and after test period, total urine volume, concentration of Na+, K+ and Cl- in the urine.Na+ and K+ concentrations was determined by flame photometer(8) and Cl- concentration was estimated by titration [9] with silver nitrate solution (N/50).

Statistical analysis

All the data are expressed as mean±SEM and analyzed by ANOVA followed by Dunnet's -test (n=6).

Table 1. Diuretic activity of*Buteafrondosa*leaves extract

Treatment	Dose mg/kg	Mean urine vol. (ml)	Electrolyte concentration		
			Na^+	K^+	Cl^-
Normal	25ml./kg	2.41	60.36	57.22	70.28
Furosamide	10	4.67	91.38	80.26	95.25
Ethanolic extract	500	3.55	80.40	70.20	86.80
Aqueous extract	500	3.15	72.18	66.48	84.64

Values are mean ±SEM, *P≤0.01 when compared with control.

RESULTS AND DISCUSSION

The present study indicates the aqueous and ethanolic extract of leaves of *Buteafrondosa* at 500mg/kg, gave a mean urine volume of 3.15 and 3.55.Whereas aqueous and ethanolic extract produced urine with Na^+, K^+, and Cl^- content 72.18, 66.48, 84.64 and 80.40, 70.20, 86.80 respectively (table -I).On the basis of above result, it can be concluded that the *Buteafrondosa*leaves extract produced significant diuretic activity. However further studies are necessary to identify and isolate the active constituent responsible for its diuretic activity and also there is a need to elucidate its mechanism of action.

REFERENCES

1. Khanna, et.al.; *Indian Jour. Med. Res.*,**1968**,56,1575.
2. Puri, et.al.; *J. Sci. Indust.Res.*,**1953**,12B,462.
3. Tandon, et.al.; *Proc.Nat. Acad. Sci.India* ,**1969**,A32, 237.
4. Seshadri, et.al.; *Indian Jour. Chem.,* **1971**,9, 1201.
5. Kamboj,et.at.; *Jour. Ethnopharmacology*,**1982**,6,195.

6. Miller and Tainter "*Quantal Response Calculation of LD^{50}" in "Screening methods in Pharmacology*" Ed;RobertA.Turner, Newyork Academic Press,**1944**.
7. Lipschitz, W.L.; Haddian, Z.; Kerpscar, A., *Jour. Pharmcol. Exp. Ther.*, **1943**,79, 110 .
8. Vogel, In; "*Textbook of Quantitative Chemical Analysis*", 5th Edn., Addison Wesley Longman Ltd., England, **1989**,801 .
9. Beckette, A.H.; Stenlake, J.B., In; "*Practical Pharmaceutical Chemistry*", Part-I, 1st Edn., CBS Publishers and Distributors, New Delhi,**1997,**197 .