ORIGINAL ARTICLE

Diuretic activity of leaves of *Erythrina indica* Lam

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Erythrina indica Lam is used in the traditional medicine as diuretic. In the present study, the diuretic activity of Ethanol, Chloroform and Ethyl acetate extract of leaves of *Erythrina indica* Lam was studied and the activity was compared with furosemide as standard. All the three extract exhibited significant diuretic activity as evidenced by increased total urine volume and the urine concentration of Na^+, K^+ and Cl^-. The result thus supports the use of *Erythrina indica* as diuretic agent.

Key words: Diuretic activity, *erythrina indica*, flavonoids, leaves, papilionaceae

INTRODUCTION

Erythrina indica is a middle-sized quick growing tree found in Bengal and many parts of India especially in southern India. It belongs to the family Papilionaceae, commonly known as Mandara (in Hindi) and Indian coral tree (in English). It grows up to 18 m in height, the leaves are trifoliolate, flowers are borne in dense racemes, coral red and used traditionally for the treatment of liver trouble, joint pain, dysentery, convulsion, as a diuretic, laxative and an anthelmintic.[1-3] A perusal of literature revealed that its diuretic effects remain to be studied. Herein, we report the diuretic effect of the ethanol, chloroform, and ethyl acetate extract of leaves of *Erythrina indica* in albino rats.

MATERIALS AND METHODS

The plant materials were collected from Virudunagar District, Tamilnadu, India and authenticated by Dr. Stephen, Dept. of Botany, The American College, Madurai, Tamilnadu, India. A voucher specimen have been kept in our laboratory for future reference.

Preparation of the Extract

The air dried leaves were pulverized in to coarse particle and extracted exhaustively with Ethanol, Chloroform and Ethyl acetate by cold maceration for 16 days. These extracts were concentrated under reduced pressure and preserved in desicator for further use. The preliminary phytochemical analysis[4,5] were carried out to find out the phytoconstituents present in the crude extracts.

Diuretic Activity

Albino rats of both sex (150-250g) were collected and housed under standard laboratory conditions. They were fed with standard rat feed and water *adlibitum*. The experimental protocols were approved by institutional animal ethics committee (Approval no. 509/02/C/CPCSEA/2002). The method of Lipschitz *et al*,[6] was employed for the evaluation of diuretic activity. The animals were divided in to five groups (six in each) deprived of food and water for 18h prior to the experiment. On the day of experiment, the Group I animals received normal saline (20 ml/kg. p.o.), the Group II animals received furosemide (20 mg/kg. i.p.), the Group III, IV and V animals received Ethanol, Chloroform and Ethyl acetate extracts (250 mg/kg) respectively. Immediately after the administration, the animals were kept in metallic cages (two per cage) specially designed to separate urine and feacal matter and kept at room temperature (20±0.5°C). The total volume of urine was collected at the end of 5h. During this period no water and food was made available to the animals. The parameters accounted for ascertaining the diuretic activity are total volume of urine and the urine concentration of Na^+, K^+ and Cl^-. The Na^+ and K^+ were measured by flame photometry[7] and Cl^- concentration was estimated by titration[8] with silver nitrate solution (N/50) using 3 drops of potassium chromate as indicator. The student ''t'' value was employed for statistical analysis. All the values expressed are Mean ± S.E.M. $P < 0.05$ (Compared to control) was considered significant.

RESULT AND DISCUSSION

The preliminary phytochemical analysis showed the presence of flavonoids, carbohydrates and glycosides in all the three extracts (Ethanol, Chloroform and Ethyl acetate). All these extracts at 250 mg/kg showed increase in urine volume and also the concentration of Na^+, K^+ and Cl^- in urine [Table 1]. It was previously reported that the flavonoid glycosides are endowed with diuretic

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Table 1: Diuretic activity of ethanol, chloroform and ethyl acetate extracts of leaves of *Erythrina indica* Lam

Treatment	Dose	Total urine volume (ml/24h)	Total Na^+ (µmoles/kg)	Total K^+ (µmoles/kg)	Total Cl^- (µmoles/kg)	Na^+ / K^+ ratio
Normal saline	25 ml/kg. p.o.	16.5±0.67	76.27±0.26	72.52±0.56	650.92±0.59	1.05
Furosemide	20 mg/kg. i.p.	41.5±0.27*	160.45±0.92*	135.58±0.76*	2913.45±0.82*	1.18
Ethanol extract	250 mg/kg. i.p	25.6±0.36*	125.76±0.86*	117.69±0.52*	2106.57±0.93*	1.06
Chloroform extract	250 mg/kg. i.p	21.9±0.54*	106.65±0.69*	102.83±0.96*	1546.59±0.67*	1.03
Ethyl acetate extract	250 mg/kg. i.p	23.2±0.43*	115.47±0.56	109.61±0.50*	1826.97±0.27*	1.05

Mean ± S.E.M, n = 6, Student ''t'' test, *P< 0.05 (Compared to control) was considered significant

activity.[9] Therefore we concluded that the diuretic activity of *Erythrina indica* may be due to the presence of flavonoids in all the three extracts. It was also concluded that the leaves of *Erythrina indica* possesses Hyper chloremic, Hyper natremic and Hyper kalemic diuretics. The present study thus justifies the traditional use of *Erythrina indica* as diuretic and also points out that *Erithrina indica* warrants future detailed investigation as a promising diuretic agent.

REFERENCES

1. Nadkarni KM, Nadkarni AK. Indian materia medica, Mumbai Popular Prakashan 1992;1:508.
2. Kiritikar KR, Basu BD. Indian medicinal plants. 2nd ed. Vol 1. Dehradun: Lalit Mohan Basu;, 1991. p. 1091.
3. Joshi SG. Indian medicinal plants. Oxford: IBH Publishers; 2000. p. 198.
4. Trease GE, Evans WC. Pharmacognosy. 13th ed. Delhi, India: ELBS Publication; 1989. p. 171.
5. Harborne JB. Phytochemical methods: A guide to modern techniques of plant analysis. 2nd ed. New York: Chapman and Hall; 1984. p. 85.
6. Lipschitz WL, Haddian Z, Kepscar A. Bioassay of diuretics. J Pharmacol Exp Ther 1943;79:110.
7. Vogal. Textbook of quantitative analysis of chemical analysis. 5th ed. England: Addition Wesley Longman Ltd; 1989. p. 801.
8. Becket BH, Stenlake JB. Practical pharmaceutical chemistry. Part-1, 1st ed. New Delhi, India: CBS Publishers and Distributors; 1997. p.197.
9. Kavimani S, Ilango R, Gurubatham J, Jaykar B, Majumber UK, Gupta M. Acetylcholine antagonistic action of aqueous extract of orthosiphon thymiflorus. Indian J Pharm Sci 1997;59:271-2.

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