SCREENING OF ACHYRANTHUS ASPERA, ACORUS CALAMUS, CAESALPINIA CRISTA FOR DIURETIC ACTIVITY

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ABSTRACT:

There are many plants reported to have diuretic activity. Diuretics are gaining increasing importance as the lifestyle diseases like hyperstension is on rise in today's modern world. The aim of the present study was to screen few plants grown in the medicinal plant garden of the institute for diuretic activity. Prepartion of crude extract was done from Achyranthus aspera, acorus calamus, Caesalpinia crista, plant when plant attained its maximum growth, using Soxhlet apparatus, percolators and using hydroalcoholic and alcoholic solvents. Diuretic activity was done on male rats using metabolic cages and urinary output was the parameters measured before and after the administration of crude extract of the plant.

INTRODUCTION

Diuretics are the drugs which increses the flow of urine. The diuretics which are therapeutically important, produce a loss of both water and solutes. Many drugs know to cause diuretic action, act by either of the following ways.

1) They increase the renal blood flow and glomerular filteration rate. Although, such action leads to diuretic effect exerted by such drugs. All three xanthines (theobromine, caffeine and theophyllin) have diuretic properties, which may validate the traditional use of the plant a s a diuretic.

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2) The other drugs increase the solute excretion in the glomerular filtrate and tubular fluid. This group includes drugs acting in two different ways. Some are called osmotic diuretics which are not electrolytes. They are freely filtered at the glomerulus and they are very little reabsorbed through the renal tubule. The other drugs inhibit sodium reabsorption from the glomerular filtrate. They increase the amount of solute excreted and thus, of water too.

3) Some plants produce diuretic effects comparable to the high ceiling diuretic furosemide.

The whole Achyranthum plant contains the alkaloids achyranthine and betaine. The plant is much valued in

indigenous medicines. It is reported to be pungent, astringent, pectoral and diuretic. Several studies for screening of phytochemical and pharmacognostical studies of Achyranthus species showed presence of carbohydrates. proteins, alkaloids, Sterols, Phenols, flavonoids, tannins and saponin (Geetha et al. 2006 Kokate and Gokhale 2002 Nadkarni, 1976, Dhiman, 2006).

MATERIALS AND METHODS :

Preparation of drug and its recomonded dosage :

Achyranthus aspera Linn. (Amaranthaceae) : The inflorescece of Achyranthus aspera is taken and is dried. After drying it is burnt till it turns white in colour. It was then soaked in water for 24 hrs. The carbon settles down after soaking and the supernatent is taken and is dried. After drying white powder is obtained which is known as amamargkshar. This apamargkshar is then mixed with water and used as drug. Dose : 100 mg/ml of water.

Acorus calamus Linn. (Aracaceae) : The rhizome of acorus calamus is taken and dried, it is then powdered. This powder is then mixed with water and used as drug. Dose : 200 mg/ml of water.

Caesalpinia crista Linn (Leguminosae) : The fruits of the plant are taken and then dried and powdered. This powder is then mixed with water and used as drug Dose : 100 mg/ml of water.

Methods : Male rats (Wistar albino strain) weighing between 180-220 g were procured from central animal house of Prin. K. M. Kundnani College of Pharmacy, Ulhasnagar. The animals were maintained under standard conditions of temperature and humidity. Five groups of three rats each were fasted and deprived of water for eighteen hours prior to the experiment. On the date of the experiment animals were given normal saline orally, (5ml).

Control animals received saline only Immediately after dosing, the rats were placed in metabolic cages (one in each cage) especially designed to separate urine and faeces. Animals were kept at room temperature of 35 +-1 degree celsius, throughout the experiment. The urine was collected in measuring cylinder upto 5 hrs after dosing. During this period, no food or water was made available to the animals the total volume of urine collected was measured for both control and treated groups. The parameter taken was total urine volume. For standard group. Furosemide sodium salt was given by stomach tube. Optimal dose activity relation was found to be 100mg of furosemide per kg body weight in a series of supportive experiments.

RESULTS AND DISCUSSION :

Th e present (Table 1) investigation reveals that since the urine output is more in experimental group 1 and 2 compared to control group, the drugs possess diuretic activity. On the other hand, experimetal group 3 does not show any increase in the urine output. Hence it does not possess any diuretic activity.

Table 1 : Screening of Achyranthus aspera, Acorus calamus and Caesalpinia cristata on diuretic activity.

Sr. No.	Set-ups	Mean Value
1	Control	3.5 ml
2	Furosoemide	6.2 ml
3	E-1 Achyranthus aspera	8.0 ml
4	E-2 Acorus calamus	6.8 ml
5	E-3 Caesalpinia crista	2.3 ml

Five set-ups showing control, standard and three experimental set-ups were made. The mean value of urine output of E-1 was highest i.e. 8.0 ml, followed by E-2 i.e. 6.8 ml, followed by the standard set up i.e. 6.2 ml, control showed 3.5 mland the least mean value was calculated as 2.3

ml. Similar types of observation recorded by earlier worker (Molina and Contresas, 1999) Vetrichelvan and Jagadeesan, 2001).

CONCLUSION :

Thus, from the results of current investigation, it may be inferred that the extract made from the plants, Achyranthus aspera and Acorus calamus possess diuretic activity, whereas the drug prepared from from the plant Caesalpinia crista does not possess diuretic activity. Hence more and more medicinal plants with different pharmaceutical properties can be traced and these findings can be made available for the benefit of mankind. This present study can be extended to large number of animals and the present investigation can have commercial application

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REFERENCES :

Dhiman, A. K. (2006) : Ayurvedic Drug Plants, Daya Publishing House Delhi, 395-397.

Geetha, G., Chandrasekharan, A. K., Brindha, P., Shyamala, G (2006) : Preliminary phytochemical and pharmacognostical studies of Achyranthus trubrofusca Linn; Hamdad Medicus, V . 49 (4) : 115-120.

Kokate C. K., Gokhale, J. B. (2002) : Textbook of Pharmacognosy, Nirali Prakashan, Pune.

Nadkarni, K. M. (1967) : Indian Materia Medica, V-I, II, Popular Prakashan, Mumbai.

Molina M, Contresas C.M., (1999) : Mimosa pudica may possess anti depressant action in the rat, Phytomedicine, 6 (5) 319-323.

Vetrichelvan T., Jegadeesan, M (2001) : Diuretic activity of alcoholic extract and decoction of Achyranthus aspera Linn. in rats; Hamdard Medicus V. 44 (3) : 38-41.