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Role of piper betle (Family-Piperaceae) leaves extract for diuretic activity

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Abstract

We know kidney is the excretory organ of our body its main function to excrete waste product, electrolyte content and regulation of fluid volume if main vital organ kidney is damage then this can lead to remove complication of life threatening the urine level increasing by the diuretic drugs the pepper aqueous and alcoholic extract of leaf whose scientific name is piper betle were tested for diuretic activity in rats the individual rat were body weight before and after test period volume urine concentration a total urine of Na⁺, K⁺ and Cl⁻ done by the studied parameter as the recent study aqueous and alcoholic extract was investigated piper betle leaves (100 mg) of body weight should increases in urine volume anion and cation excretion. Torsemide was used as reference diuretic.

Keywords: Diuretic activity, Torsemide, piper betle leaf extracts

Introduction

Increase the rate of urine flow it's done by the diuretics drugs sodium excretion and mainly used to control the volume and composition of body thirds in a variety of clinical situated This is beneficial that drug produced diuretics in many life threatening diseasing in many life threatening disease condition such as nephritic syndrome cirrhosis congestive heart failure renal failure, hypertension and pregnancy toxemia .The adverse effect is produced by most diuretic drugs an quality of life including fatigue impotence and wellness. Actually caffeine in coffee, cola, and tea include naturally diuretics which mainly inhibit Na⁺ reabsorption and secretion or ABH piper betle plant belongs to Piperaceae it is very easily found in India it is used as antiseptic, stimulant, breath freshener also is communicable and non – communicable diseases like cold, cough, bronchial asthma etc it has also ant allergic, anticancer and ant diuretic activities the leaf extract of bottle posses antifungal and antimicrobial activities also hence this research done for the diuretic activity of aqueous and alcoholic extract of piper betle (Piperaceae).

Material and Method

The leaves of Piper Betle (Family-Piperaceae) were collected in the month of December from a shop situated in Malbazar. After it will be authenticated by the lab. The piper betle dried leaves were ground to coarse powder. The pet was defatted by powder. Ether and the extracted with ethanol which is evaporated further to dryness to obtain alcoholic extract.

Extraction and Phytochemical Screening of Plant

With the petroleum ether at 40 °C-60 °C the powdered plant material (500 gm) were extracted, by continuous hot percolation using Soxhlet apparatus. By using solvent the extraction was carried out of increasing polarity starting from petroleum ether and methanol respectively. For 74 hrs the extraction was carried out. First when the extract of petroleum ether was filtered and concentrated to dry mass by using vacuum distillation. After this a dark greenish brown residue was obtained. After petroleum ether extraction was taken when the marc left and then extracted with methanol for 74 hours. Then filtered the methanolic extract and concentrated to dry mass. Then obtained a dark greenish residue. By using standard procedure the phytochemical screening was performed.

Experimental Animals

As in the pet shop the strains of Wistar Rats of either sex weighing 152-253 gm procured from the animal house, used for the study. In the polypropylene cages the animals were maintained

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of standard dimensions at a temperature of 28 ± 1 °C and standard 14 hour. Night rhythm of 14 hour day. By the standard rodent pellet diet the animals were fed and water. Before to the experiment the animals were acclimatized to the laboratory conditions.

Drug

Torsemide tablet collected from Malbazar as the tablet used in diuretic agent. The standard solution was prepared in solvent by dissolving the tablet. The dose of Torsemide maintained 25mg/kg body weight.

Study of the Acute Toxicity

The study of the acute toxicity was carried out by using doses of drug were administered intraperitoneally in graded doses (50 to 250 mg/kg body weight). They were observed continuously for the first 2hr30min for the toxic symptoms and upto 28 hr for mortality.

Diuretic Activity

First weighing 150 gm to 180 gm of male rats (Wister albino strain) were maintained under standard condition of temperature and humidity. As the six rats of each in four groups and were fasted and deprived of water for 20hours prior to the experiment. As received the normal saline (25 ml/kg, p.o.) by the first group of animals serving as control but second group received Torsemide (25 mg/kg i.p.) in saline. After the third and fourth groups received the aqueous extra and alcohol at the dosage of 25mg/kg respectively in normal saline. After administration immediately the animal were placed in metabolic cages (2 per cage) specially designed to separate urine and feces. After kept at room temperature 25 ± 0.5 °C throughout the experiment by the measuring cylinder the urine was collected up to 3 hours after doing. No food or water was made available to animals during this period. For individual rate the parameter taken and were body weight before and after test period, total concentration of Na⁺, K⁺ and Cl⁻ in the urine by the flame photometry Na⁺, K⁺ concentration were measured and example- concentration was estimated by titration with silver nitrate solution using three drop of 5% potassium chromate solution as indicator. In the stomach the torsemide sodium salt was given. Optimal

dose activity relation was found to be 5 mg/KG of torsemide per kg body weight in series of supportive experiments result are reported as mean \pm SD, the test of significance was statistically. ($p < 0.01$ AND $p < 0.05$)

Statistical Analysis

As by all the results are expressed as mean \pm standard error. The analyzed data was statistically using ANOVA at a probability level of $p < 0.001$

Results and Discussion

In this basic phytochemical screening of the ethanol traction slowed the presence of tannins, terpenoids, flavonoids, alkaloids. As in this research I saw that alcoholic and aqueous leaf extract of Piper Betle possess a very good diuretic activity. The cation and anion of urine volume were increased, Na⁺/K⁺ ratio 2.08 and 2.22 were obtained for aqueous and alcoholic extract respectively. The normal value Na⁺/K⁺ ratio of is reported 2.09-2.87. I found to be dependent on Na⁺/K⁺ ratio of the concentration of aldosterone. Below the normal in plasma the aldosterone will be decreased if the Na⁺/K⁺ falls and the normal value of aldosterone secretion will be increased if the ratio rises. In aqueous and alcoholic extract this is the significant increase in Na⁺, K⁺ and Cl⁻ ion excretion but it was less than the Torsemide control.

We know peripheral edema and pulmonary congestion relieve by diuretics. For the hypertensive patients the diuretics play an important role. In recent study we explained that ethanol and aqueous extract may produce diuretic effect by increasing the excretion of Sodium, Potassium and Chloride. This is important in the regulation of blood volume and pressure by the control of plasma sodium.

For the function of cardiac and skeletal muscles the control of plasma potassium is required is related to renal control of acid base balance.

In recent study alcohol and aqueous extracted showed elevated levels of Potassium in urine, may be increase the risk of hypokalemia.

In the result it showed ethanol is most effective increasing electrolyte concentration of all the ions i.e. Potassium, Sodium and Chloride.

Table 1: Diuretic Activity of Piper Betle (Family-Piperaceae)

Extract	Dose	(Electrolyte Labels)	(Electrolyte Labels)	(Electrolyte Labels)
		Na ⁺	K ⁺	Cl ⁻
Aqueous	250 mg/kg b.w	114.2 \pm 2.046**	66.64 \pm 0.6433**	127.7 \pm 1.872**
Aqueous	500 mg/kg b.w	128.2 \pm 0.9853**	73.64 \pm 0.5200**	128.2 \pm 2.222**
Alcohol	250 mg/kg b.w	120.9 \pm 0.5200**	71.24 \pm 0.5037**	120.9 \pm 1.641**
Alcohol	500 mg/kg b.w	136.6 \pm 1.226**	89.17 \pm 0.2910**	136.6 \pm 1.951**
Torsemide	5 mg po	145.56 \pm 2.474**	87.67 \pm 1.786**	145.56 \pm 2.638**
Normal Saline	25 ml/kg po	85.14 \pm 2.896**	59.03 \pm 1.306**	85.14 \pm 1.130**

Each value represents the mean \pm SEM of six rats
 $p < 0.05$ *, $p < 0.01$ ***, $p < 0.001$ ***

Conclusion

The leaf extracts of Piper Betle have diuretic effect that support the ethnopharmacological use as diuretics. This effect is used for the management of inhibit bacterial growth.

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