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# Evaluation of anti-nephrolithiatic activity of *Pedalium murex* Linn. leaves in albino rats

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**ABSTRACT**

*Pedalium murex* (Linn), (pedaliaceae), a plant which is useful in urinary diseases conditions is distributed in the coastal areas of south India. The aim of the work was to study the anti nephrolithiatic activity of various extracts of *pedalium murex*. Petroleum ether, chloroform, ethanol and aqueous extracts of the plant were prepared and evaluated for anti nephrolithiasis activity. Albino rats were treated with the prepared extracts. Thus it may be concluded that *pedalium murex* possesses significant anti nephrolithiatic activity.

**Key words:** *Pedalium murex*, anti-nephrolithiasis, petroleum ether extract, chloroform extract, ethanol extract.

## INTRODUCTION

India has a rich heritage of medicinal herbs which are used by local population and traditional practitioners for the treatment of several disease conditions. Diseases related to renal system are common and so many researches are going on to cure it. One of the common renal diseases is urinary stone formation called as nephrolithiasis. Hypercalciuria & Hyperoxaluria is the common cause of urinary stone formation. *Pedalium murex* Linn, family pedaliaceae which is commonly known as Gokhru is useful in urinary diseases conditions such as gonorrhea, dysuria and incontinenece of urine. *Pedalium murex* is distributed in the coastal areas of south India. Therefore present study was undertaken to evaluate the anti-nephrolithiatic activity by using various extracts of *Pedalium murex* Linn.

## MATERIAL AND METHODS

### Plant material

*P. murex* was collected from Pattukottai district, India and authenticated by Plant Anatomy Research Centre (PARC), Medicinal Plant Research Unit, Chennai.

### Preparation of Extracts

The shade dried leaves, stems, roots, flowers, fruits and seeds of about 1 kg were subjected for size reduction to coarse powder. Petroleum ether extract was prepared by soxhlet extraction apparatus. Chloroform and 70% ethanol extract were prepared by maceration process. Aqueous extracts were prepared by soxhlet extraction apparatus.

The percentage yield (w/w) of petroleum ether, chloroform, ethanol and aqueous extracts were 7.9, 6.7, 2.76 and 5.9 respectively.

**Animals**

In bred albino rats (weight 150-230gms) were used.

The animals were maintained in a ventilated room with 12:12 hour light, dark cycle in polypropylene cages. Standard pellet feed (Hindustan lever Ltd. Bangalore) and tab water ad libitum were provided throughout experimentation period. Animals were acclimated to laboratory conditions one week prior to initiation of experiments; the animals were deprived from food for 16 hrs but freely allowed to access water. The experiments were conducted according to the guidelines for Experiments on Animals, India and approved by ethical committee. (Ref.No: IAEC/XIII/21/CLBMCP/2005-2006.20/10/06).

**Toxicity Studies**

**Acute Oral Toxicity**

**Ecobichon DJ**

The basics of toxicity testing 2nd edition. CRS. Press Newyork (1997) 43-85. The procedure was followed by OECD guidelines, 423 (Acute toxic class method).

**Determination of LD50 value**

The determination of $ED_{50}$ values helps in ascertaining the potency of a drug in terms of reference standards, when the response in quantol, the $ED_{50}$ values become $LD_{50}$, found by "Hit and Trial" method.

**Anti nephrolithiasis activity of various extracts of *pedalium murex* linn**

Thirty five albino rats of either sex were divided into seven groups which comprises of 5 animals each. Rats of each group were treated for 7 days. Group I was used as control. Group II received ethylene glycol with ammonium chloride. Group III received ethylene glycol with ammonium chloride treated with standard drug. Group IV received ethylene glycol with ammonium chloride treated with petroleum ether extract of *Pedalium murex* Linn. Group V received ethylene glycol with ammonium chloride treated with ethanolic extract

**Table 1: Anti nephrolithiasis activity of *Pedalium murex* extracts**

| S.No | Design of treatment | Serum analysis of the following in mg/dl Mean ± sem | | | | | |
|---|---|---|---|---|---|---|---|
| | | Urea | Calcium | Creatinine | Phosphate | Uric acid | Magnesium |
| 1. | Control | 73±0.9714 | 21±0.412 | 2.52±0.134 | 9.15±0.192 | 28.2±0.537 | 9.6±0.412 |
| 2. | Ethylene glycol with $NH_4Cl$ and standard drug extract | 51.2±1.174 | 18±0.5 | 2.04±0.143 | 8.26±0.212 | 30.84±0.706 | 10.3±0.612 |
| 3. | Ethylene glycol with $NH_4Cl$ | 102.4±0.9299 | 28.1±0.535 | 4.1±0.136 | 9.45±0.223 | 42.3±0.8327 | 8.4±0.317 |
| 4. | Ethylene glycol with $NH_4Cl$ and petroleum ether extract | 55.2±1.172 | 19±0.572 | 2.08±0.5 | 8.28±0.13 | 31.82±0.220 | 10.8±0.412 |
| 5. | Ethylene glycol with $NH_4Cl$ and Chloroform extract | 69±0.651 | 24±0.13 | 2.98±0.15 | 8.22±0.223 | 26.3±0.6272 | 9.4±0.438 |
| 6. | Ethylene glycol with $NH_4Cl$ and Methanolic extract | 58.9±1.43 | 23±0.5 | 2.54±0.15 | 8.22±0.223 | 26.3±0.6272 | 9.4±0.438 |
| 7. | Ethylene glycol with $NH_4Cl$ and Aqueous extract | 68±0.9924 | 20±0.621 | 3.08±0.13 | 9±0.212 | 25.3±0.6272 | 9.4±0.521 |

of *Pedalium murex* Linn. Group VI received ethylene glycol with ammonium chloride treated with chloroform extract of *Pedalium murex* Linn. Group VII received Ethylene glycol with ammonium chloride treated with aqueous extract of *Pedalium murex* Linn. On the eighth day animals were anesthetized and blood samples were collected for analysis.

**Assessment of Renal function**

Blood samples were collected from ratino bulber venous plexus with the help of a glass capillary under light ether anaesthesia.. The blood samples were centrifuged and the serum separated was used to estimate urea, calcium, creatinine, phosphate, uric acid and magnesium.

## RESULTS

**Preliminary phytochemical screening**

Preliminary phytochemical screening indicated that the petroleum ether extract was found to contain glycosides, fixed oils, fats, proteins, phytosterols, steroids, alkaloids and flavonoids, the ethanol extract contains glycosides, proteins, phytosterols, steroids and flavonoids, the chloroform extract contains glycosides, phytosterols, steroids and flavonoids and the aqueous extract contains carbohydrates, glycosides, phytosterols and steroids.

**Toxicity studies**

The extract of *Pedalium murex* was found to be safe for further biological studies, as no lethality were obsereved at 1000mg/kg, orally in rats.

**Anti nephrolithiasis activity of various extracts of pedalium murex linn**

The results of the various extract reveal that the *Pedalium murex* is having anti nephrolithiasis activity. The petroleum ether extract was found to possess maximum anti nephrothiasis activity. The results were given in table 1.

## CONCLUSION

In Indian system of medicine *Pedalium murex* is claimed to have property to cure the renal diseases. So this work was planned to know about the anti nephrolithiasis property of the pedalium murex. Various extracts of pedalium murex were prepared. From this study it can be concluded that the petroleum ether extract of P.murex showed better anti nephrolithiasis activity among the other extracts.

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