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EVALUATION OF *IN VITRO* ANTIUROLITHIATIC ACTIVITY OF *ELAEOCARPUS GANITRUS*

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ABSTRACT

The present study explored that evaluation of in vitro anti urolithiatic activity of Elaeocarpus ganitrus. It was observed that the highest calcium oxalate crystals dissolution was observed in the Methanol extract of Elaeocarpus ganitrus. It was found that Methanol extract of Elaeocarpus ganitrus has more efficient to dissolve calcium oxalate. It clearly shows that it was very efficient and more than the standard drug. In this study neeri was used as standard drug.

Keywords: *Anti urolithiatic activity, Methanol extract,* Elaeocarpus ganitrus.

INTRODUCTION

Urolithiasis or Uroliths is the formation of stones in the kidney, bladder, ureter, urethra or any part of urinary tract. It occurs due to inadequate urinary drainage, presence of foreign bodies in urinary tract, microbial infections, diet rich with oxalates and calcium, vitamin deficiencies like vitamin A and metabolic disorders like hyperthyroidism, cystinuria, gout, etc [1]. It effects about 10-12% of the world population mostly in the industrialized countries [2]. It is the third most prevalent disorder in the urinary system with recurrence rate of 50% [3]. Urolithiasis occurs as a result of successive physiological events like supersaturation of urine, nucleation, growth, aggregation and retention of calculi within the renal tubules [4]. Renal calculi are composed of calcium oxalate, struvite, uric acid and cysteine [5]. But the majority of the renal stones are calculi of calcium oxalate crystals about 80% in the urinary tract [6]. Plants provides food, raw materials,cloth,shelter and medicines and other requirements for the existence of life from the origin of human beings. The majority of the global population utilizes medicinal plants for their health care [7]. In the ayurvedic system of medicine in India,Plants which belongs to Pashanabheda group are claimed to be useful in the treatment of urinary stones. Pashanabheda is the Sanskrit term used for a group of plants with diuretic and antiurolithiatic activities [8,9]. Drugs with multiple mechanisms of protective action provideminimizing the diseases [10].

MATERIALS AND METHODS

Plant materials

The leaves of *Elaeocarpus ganitrus* were procured from the local areas of Narsapur, in the month of January. The plant was authenticated by M.Malla Reddy(M.Sc,M.Phil in botany)retired lecturer in botany,Vikarabad,Telanagana. The leaves were washed with tap water and dried under shade.

Preparation of plant extracts

The leaves of plant were dried under shade and crushed in pulveriser and powdered. These powdered plant material was extracted with methanol and Water in a soxhlet apparatus for 72 hours. After complete extraction, the extracts were cooled at room temperature and filtered and evaporated to dryness using rotary evaporator

Chemicals used

Neeri, Sodium oxalate, neeri, Tris buffer, calcium chloride, Potassium permanganate($KMnO_4$), Sulphuric acid(H_2SO_4).

In vitro anti lithiatic activity test by titrimetry

The experimental kidney stones of calcium oxalate (CaOx) were prepared in the laboratory by taking equimolar solution of calcium chloride dehydrate in distilled water and sodium oxalate in 10 ml of 2N H_2SO_4. Both were allowed to react in sufficient quantity of distilled water in a beaker, the resulting precipitate was calcium oxalate. The precipitate was freed from traces of sulphuric acid by ammonia solution, washed with distilled water and dried at 60^oC. The dissolution percentage of calcium oxalate was evaluated by taking exactly 1 mg of

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calcium oxalate and 10 mg of the extract, packed it together in semi permeable membrane of egg as shown in the model designed given below. This was allowed to suspend in a conical flask containing 100 ml of 0.1M Tris buffer.

First group served as blank containing only 1 mg of calcium oxalate. The second group served as positive control containing 1 mg of calcium oxalate and along with the 10 mg standard drugs, i.e. Neeri. The 3rd, 4th groups along with 1 mg of calcium oxalate contain methanolic and Methanol, extracts. The conical flasks of all groups were kept in an incubator preheated to37ºC for 2hrs. Remove the contents of semi permeable membranes from each group into separate test tubes, add 2 ml of 1Nsulphuricacid to each test tube and titrated with 0.9494 N $KMnO_4$ till a light pink colour end point obtained. The amount of remaining undissolved calcium oxalate is substracted from the total quantity used in the experiment in the beginning to know the total quantity of dissolved calcium oxalate by various solvent extracts.

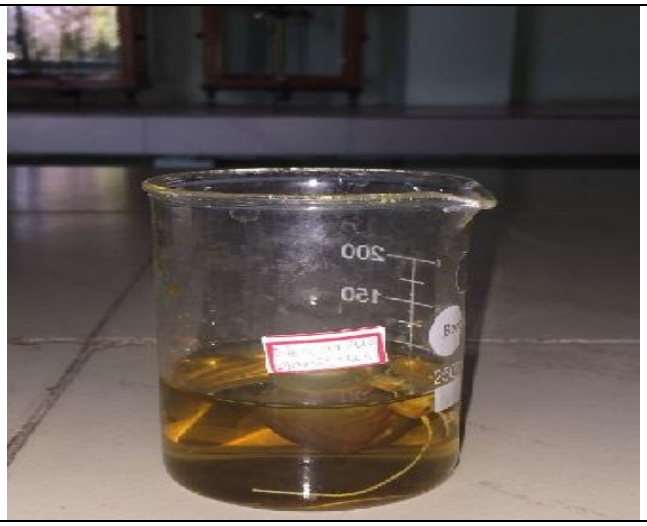
RESULTS AND DISCUSSION

This study evaluates the antiurolithiatic activity of different extracts of *Elaeocarpus ganitrus.* (Table 1 and Figure 1). The percentage, i.e. 81% of calcium oxalate (CaOx) dissolution was observed in Neeri and highest percentage, i.e. 92% of calcium oxalate dissolution was observed in Methanol extract. The Methanol extract was found more effective in dissolution of CaOx. From this study, it was observed that Methanol extract of *Elaeocarpus ganitrus* leaves showed highest dissolution of calcium oxalate This study has given primary evidence for *Elaeocarpus ganitrus* as the plant which possess lithotriptic property. This in vitro study has given lead data and shown that Methanol is quite promising for further studies in this regard.

Table 1. Shows % dissolution of calcium oxalate (CaOx) by in vitroantiurolithiatic activity of Elaeocarpus ganitrus. leaves extracts.

	% of dissolution of calcium oxalate	
S.NO	**Groups**	**Elaeocarpus ganitrus**
1	**Blank**	**0**
2	**Positive control**	**81**
3	**Methanol extract**	**92**

Fig 1



CONCLUSION

In vitro urolithiasis has been performed on medicinal plant, i.e. Elaeocarpus ganitrus leaves by using the standard drug, Neeri. The work was performed by using in vitro antiurolithiatic model for calculating percentage dissolution of kidney stone. Methanol extract of *Elaeocarpus ganitrus* leaves showed highest dissolution of calcium oxalate i.e. more compared to standard drug Neeri. This study has given primary evidence for Elaeocarpus ganitrus the plant which possess lithotriptic property.

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