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Evaluation of *In Vitro* Antiuro lithiatic Activity of *Ziziphus jujuba*

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ABSTRACT

The present study explores that evaluation of in vitro anti urolithiatic activity of *Ziziphus jujuba*. It was observed that the highest calcium oxalate crystals dissolution was observed in the ethanol extract of *Z. jujuba*. It was found that ethanol extract of *Z. jujuba* 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

Antiuro lithiatic activity, Ethanol extract, *Ziziphus jujube*

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] Among the several types of kidney stones, the most common are calcium oxalate stones representing up to 80% of the analyzed stones [2]. The formation and growth of calculi continues to trouble mankind as there is no satisfactory drug to treat kidney stones. Several plant extracts have been used to treat kidney stones with promising effect in prevention and treatment [3-6]. Drug treatments are available for elimination of kidney stones. The purpose of medical management is breaking the stone or dissolving the stone and prevent recurrence of stone. Citrate prevents the recurrences rate of stone [7]. So patients are advised to increase the consumption of citric acid contain juices [8]. Alpha blockers inhibit ureteral muscle spasm and decrease the basal tone, reduce the peristaltic frequency and colic pain and there by improve the stone expulsion [9].

MATERIALS AND METHODS

Plant materials

The leaves of *Ziziphus jujuba* were procured from the local areas of Narsapur, in the month of March. The plant was authenticated by M. Malla Reddy (M.Sc, M.Phil in botany) retired lecturer in botany, Vikarabad, Telangana. 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 h. 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 antilithiatic 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 2 N 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°C . The dissolution percentage of calcium oxalate was evaluated by taking exactly 1 mg of calcium oxalate and 10 mg of the extract, packed it together in semipermeable membrane of egg as shown in the model designed given below. This was allowed to suspend in a conical flask containing 100 ml of 0.1 M Tris buffer (Figure 1).

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 to 37°C for 2 h. Remove the contents of semipermeable membranes from each group into separate test tubes, add 2 ml of 1 N sulphuric acid 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

subtracted from the total quantity used in the experiment in the beginning to know the total quantity of dissolved calcium oxalate by various solvent extracts [10].

RESULTS AND DISCUSSION

This study evaluates the antiurolithiatic activity of ethanol extract *Z. jujuba*. The highest percentage i.e. 98% calcium dissolution was found in ethanol extract of *Z. jujuba* whereas lowest percentage i.e. 81% was found in case of standard drug, Neeri. Thus, maximum activity for calcium dissolution was found in case of plant extract and compared with that of standard drug. This *in vitro* study has given lead data and shown that ethanol extract is quite promising for further studies in this regard (Table 1).

CONCLUSION

In vitro antiurolithiatic activity has been performed on plant i.e. *Z. jujuba* leaves by using standard drug, Neeri. The work was performed by using *in vitro* antiurolithiatic model for calculating percentage dissolution of kidney stone. The ethanol extract of *Z. jujuba* showed maximum activity when compared to the standard drug, Neeri. Thus, plant extract showed evidence for lithotropic activity.

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Figure 1: *In vitro* anti lithiatic activity test by titrimetry



Table 1: Shows % dissolution of Calcium Oxalate (CaOx) by *in vitro* antiurolithiatic activity of *Ziziphus jujuba* leaves extracts

S. NO.	% of dissolution of calcium oxalate	
	Groups	<i>Ziziphus jujuba</i>
1	Blank	0
2	Positive control	81
3	Ethanol extract	98

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