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A STUDY ON AN IN-VITRO UROLITHIATIC ACTIVITY OF AQUEOUS EXTRACTS OF LEAVES OF TECOMA STANS

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ABSTRACT:
Kidney stones, also referred to as renal calculi, are hard solid structures formed from crystal substances. These stones usually start in your kidneys but can form at any point along the urinary system. When looking at the likelihood of recurring stones, it's anywhere from 21% to 53% within three to five years after the initial occurrence. The study observed the occurrence of urolithiasis, which is the formation of urinary stones, ranges from 5% to as high as 19.1% across West Asia, Southeast Asia, South Asia, and certain industrialized nations like South Korea and Japan, compared to a lower incidence of 1% to 8% in the majority of East Asia and North Asia. Commercially so many drugs are available for this treatment.But the natural remedies are known to have a lower risk of causing less adverse effects or allergic reactions compared to other treatments. The aim of the present study is to evaluate the urolithiatic activity of the leaves of tecoma stans.Thiscan be done by carrying out pharmacological studies with the aqueous leaves extract in-vitro models with the use of Semi-Permeable Membrane from Farm Eggs. The percentage dissolution of stones, observed in each group: the positive control yielding a 95% dissolution, the negative control at 20%, the high dose of Tecoma stans demonstrating an89% dissolution, and the low dose of Tecoma stans at 65%. The findings of the Present investigation suggests that Tecoma stans has anti urolithiatic activity.

KEY WORDS: Tecoma stans, anti urolithiatic, cystone drug, calcium oxalate.

INTRODUCTION:

Kidney stones, also referred to as renal calculi, are hard solid structures formed from crystal substances. These stones usually start in your kidneys but can form at any point along the urinary system. In Asia, it's estimated that between 1% and 19.1% of the population experiences kidney stone issues. Nonetheless, the frequency and occurrence of these stones

vary across different countries and regions, influenced by factors such as socio-economic conditions and geographical areas. Investigating the risk factors associated with urinary tract stones is of paramount significance.

Tecoma stans, also known as yellow bells, yellow elder, or trumpetbush, belongs to the Bignoniaceae family and is a flowering plant native to the Americas, especially the southern United States, Central America, and certain areas of South America. It is recognized for its vibrant, trumpet-like yellow flowers and green, dense foliage. This plant can range from a small tree to a shrub and is often incorporated into landscapes for its attractive features. Tecoma stans is capable of surviving with little water and prefers warm environments, which is why it is favoured in dry and semi-dry areas. Historically, it has been used for medicinal purposes across different cultures, although there is limited scientific research to back up these traditional uses.

MATERIALS:

Plant material collectionand Authentication:

The plant material of Tecoma stans leaves used for the investigation was collected from A.M. Reddy Memorial College of Pharmacy premises, Narasaraopet, Guntur Dist. The plant was identified and authenticated by P.SATYANARAYANA RAJU Department of Botany from Acharya Nagarjuna University, Nagarjuna Nagar, Guntur, 522510, Guntur Dist, Andhra Pradesh.

Preparation of Extract:

Tecoma stans leaves were gathered and then dried in the shade at a room temperature, followed by grinding them coarsely. These leaves were then soaked in hot distilled water to extract the active compounds. The extract was then stored in a container that was airtight for future use in pharmacological testing.

Phytochemical analysis of different Crude extracts:

Tests were conducted to identify the active components including Saponins, Alkaloids, Flavonoids,Proteins, Free Amino Acids.

Methodology

Preparation of tecoma stans leaf extract:

The leaves are gathered and rinsed several times using water until they become spotless. They are then left out in the shade for two to three days until they are fully dried. After that, the leaves are ground into a powder. To create the solution, mix 10 grams of the powdered leaves with 100 millilitres of distilled water. Heat the mixture for at least 20 minutes. Filter the resulting solution, and the filtered liquid can be utilized for testing its ability to dissolve kidney stones.

Preparation of semi permeable membrane from farm eggs:

The semi-permeable outer layer of eggs sits between the outer, hardened shell and the inner part, which includes albumin and yolk. The shell was chemically stripped by immersing the eggs in a 2M HCl solution overnight, resulting in full decalcification. Afterward, the eggs were rinsed thoroughly with distilled water and delicately punctured with a sharp needle to drain out all the contents. Then, the eggs were rinsed again with distilled water. After that, they were soaked in an ammonia solution to retain moisture and were once more rinsed with distilled water. Finally, they were refrigerated to keep them at a pH range of 7-7.4.

Estimation of Calcium oxalate by Titrimetry:

Arranged in exact weight with the kidney stones and 10 mg of the extract/chemical/concentration, placed it into a semi-permeable membrane via suturing. This

mixture was then suspended in a conical flask filled with 100 ml of a 0.1 M TRIS buffer solution. One group was used as a negative control, which only contained kidney stones. Position the conical flask with the group mixtures in an incubator set at a temperature of 370 degree centigrade for 2 hours, and then for approximately 7-8 hours. Transfer the mixture from the semi-permeable membrane into test tubes. Next, add 2 ml of 1 M sulfuric acid and perform titration with 0.9494 M potassium manganese (IV) sulphate until it reached a light pink endpoint. From this point, 1 ml of 0.9494 M potassium manganese (IV) sulphate was equivalent to 0.1898 mg of calcium. The difference in the quantity of calcium oxalate that didn't dissolve when using this much test substance is subtracted from the total amount used at the start of the experiment to determine the actual amount of calcium oxalate that was soluble in the test substance.

In the present study we taken as total groups are following:

1. Group 1 (Negative Control it contains kidney stones only)
2. Group 2 (Positive Control it contains kidney stones plus Cystone standard drug)
3. Group 3 (High Concentration it contains kidney stones plus tecoma stans extraction at 20ml)
4. Group 4 (Low Concentration it contains kidney stones plus 10 ml of tecoma stans extraction)

RESULTS:

Preliminary Phytochemical Screening for tecoma stans leaf extract

The aqueous extract of Tecoma stans leaf was subjected to preliminary tests and the results were tabulated in table. The results showed the presence of saponins, alkaloids, flavonoids, proteins, free amino acids.

Table No.01: Preliminary Phytochemical tests

S.NO	Phytochemical Tests	Inference
1	Test for Alkaloids	Positive
2	Test for Flavonoids	Positive
3	Test for Saponins	Positive
4	Test for Proteins	Positive
5	Test for Free Amino acids	Positive

TABLE FOR ANTIUROLITHIASIS

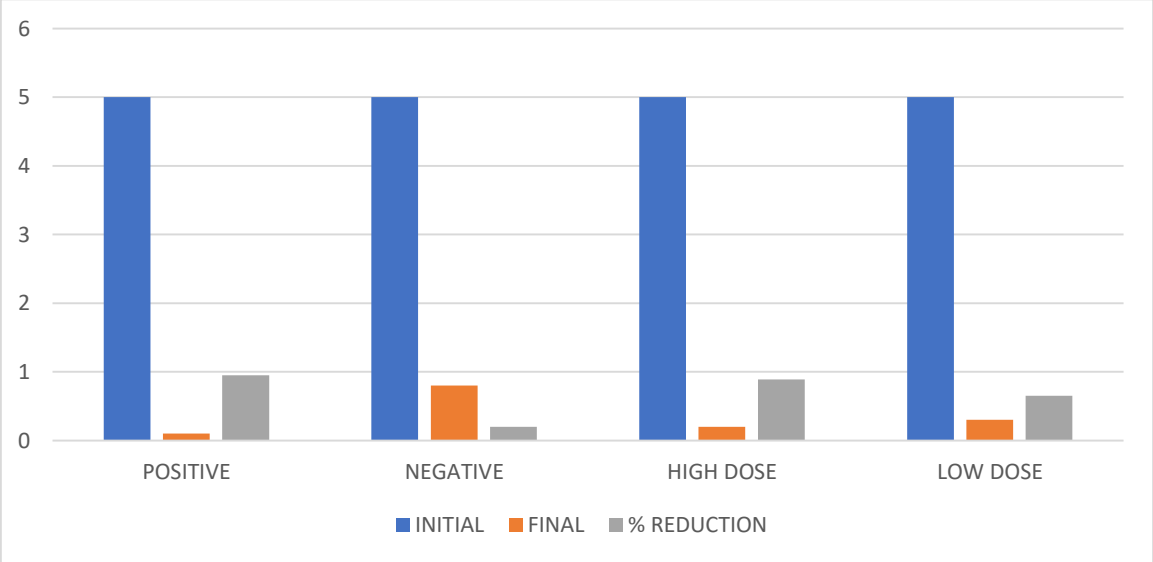
S.NO	GROUPS	INITIAL WT(G)	DISSOLVED STONE WT(G)
1	Positive control	5	4.9

2	Negative control	5	4.2
3	High dose	5	4.8
4	Low dose	5	4.6

TABLE FOR % REDUCTION IN WT

S.NO	GROUPS	INITIAL WT(G)	FINAL WT(G)	%REDUCTION IN WT(G)
1	Positive control	5	0.1	95%
2	Negative control	5	0.9	20%
3	High Dose	5	0.2	89%
4	Low dose	5	0.4	65%

HISTOGRAM OF % REDUCTION WT OF AQUEOUS EXTRACTS OF POLY HERBS BY USING ACID-BASE TITRIMETRIC METHOD



DISCUSSION:

After analysing the outcome, he engaged in talks about the percentage dissolution observed in each group: the positive control, yielding a 95% dissolution, the negative control at 20%, the high dose demonstrating an89% dissolution, and the low dose at 65%.More in-depth research is needed for a thorough comprehension of how this works.

CONCLUSION:

The findings of the Present investigation suggests that Tecoma stans has anti urolithiatic activity. It is also responsible for anti-inflammatory, antipyretic, and analgesic action is inhibition of prostaglandin synthesis by inhibition of cyclooxygenase (COX).

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