IJPHT Journal
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International Journal of Pharmacy and Herbal Technology- ISSN NO: 2583-8962 (Online)

ASSESSMENT OF IN- ANTI UROLITHIATIC ACTIVITY EPIPHYLLUM OXYPETALUM

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ABSTRACT:

The current study used in vitro methods to analyze the effects of Epiphyllum Oxypetalum extract on calcium oxalate. The leaves of Epiphyllum Oxypetalum were extracted using the Soxhlet extraction method using a solvent such as ethanol. The extracted alkaloid, flavonoid, saponin, phenol, and terpenoid content, as well as other phytochemicals, were all determined. For the in-vitro study, experimental calcium oxalate stones were generated and compared to standard treatment. Cystone is administered as normal. It has a high capacity for calcium oxalate dissolution and is high in phytochemical such as alkaloids, saponin, glycosides, terpenoids, and flavonoids. These flavonoids prevent the formation containing calcium oxalate deposits in the kidney tubules. The leaf extract contains anti-urolithiasis therapeutic and preventive capabilities, as well as the capability of reducing the size of stones. In addition to diuretic and antiurolithic actions, it has anti-diabetic, anti-cancer, anti-ulcer, anti-microbial, and wound healing qualities. The primary goal of the research is to investigate how the plant Epiphyllum Oxypetalum, namely its leaves, can be used to prevent and treat health problems such as kidney stones, which are increasingly common in younger people due to inactivity and poor diet. Because the extract may eliminate small particles from the kidney and urinary system, they are less likely to become stuck in the urinary tract and form stones.

Keywords: Herbal medicine, Kidney stone, Urinary calculi, Anti-urolithiasis,Renal calculi, Cystone.

INTRODUCTION:

Since the beginning of recorded human history, people have used plants for therapeutic purposes. In developing nations, traditional medicines, which are primarily composed of medicinal herbs, have historically been significant substitutes for modern pharmaceuticals. The usage of medicinal plants or their products is more widespread, particularly among the underprivileged rural people that lack access to healthcare. In contrast, there has been a significant rise in the demand for medicinal plants due to their chemical diversity and the ability to produce innovative therapeutic molecules to control a variety of ailments. The use of medicinal plants as a form of therapy has persisted in the literature despite significant progress being made in the discovery of new synthetic medications. As a result, the study of therapeutic plants has always been open to possibility. A crucial medicinal plant from the cactus family (family-Cactaceae),

E oxypetalum Haw, also known as "Bakawali" or "Bunga Raja" in Malaysia, finds use in traditional Malay medicine. The plant is frequently grown for decorative purposes, but rural people also use it for therapeutic purposes.

Urolithiasis is the third most common condition, affecting around 12% of the world's population. Calcified kidney stone development is a physiochemical event that results in crystal nucleation, aggregation, and growth, which is aided by a variety of biological processes such as urine volume, pH, elevated calcium oxalate or sodium oxalate, and urates. 90% of patients with upper urinary tract stones are currently treated based on their size, nature, and position, with a success rate ranging from 68 to 86%. The ingestion of more protein has been linked to an increase in the development renal stones, with calcium phosphate and/or calcium oxalate taking into consideration roughly 75% of all renal stones.

MATERIALS AND METHODOLOGY:

Plant collection and authentication:
The Epiphyllum Oxypetalum leaves were taken in March 2023 in Pandharpur, Solapur District, Maharashtra, India. Uttreshwar R. Mundhe, M.Sc. B.Ed., Botany Plant Physiology, authenticated the plant. The leaves were washed and dried in the shade after being cleansed with running water.

Fig.1: Epiphyllum Oxypetalum leaves and flower

Preparation of extracts:
Fresh stems and leaves were cleaned under running water, dried, and ground finely in a mechanical grinder.
The extraction procedures were somewhat modified from those given in. The leaf sample was cleaned with normal water, dried, and then powdered in a blender. In a variety of ratios, ethanol is used as a solvent in the Soxhlet extraction method. Filter the extract with a muslin cloth after 6 to 8 hours, transfer it 50 ml tubes, and centrifuge for 15 minutes at 4,000 rpm and 25 degrees Celsius. The supernatant consisted of preserved for drying after it was collected.

Phytochemical Analysis:

Chemical assays employing conventional techniques for screening and identifying active components in flower extracts are discussed.
Test for Saponins:
The extract was shaken vigorously in a test tube. The existence of saponins was discovered. was determined by manufacturing stable foam.

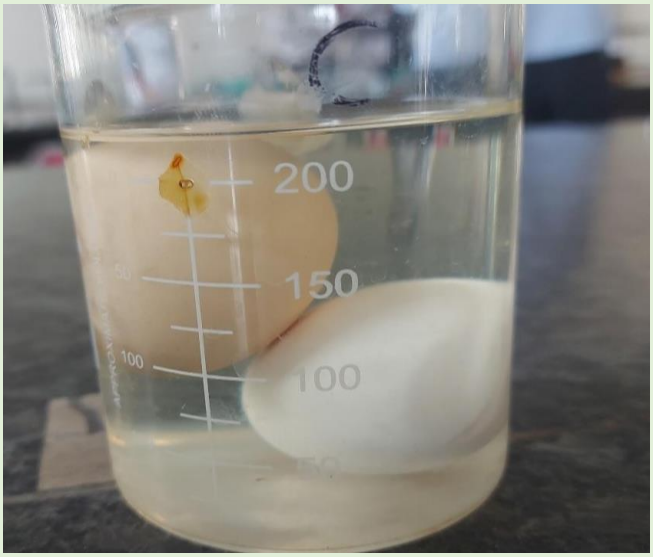
Test for Phenols:
1 mL of a 2% FeCl3 solution was mixed in with the extract. The blue/green tint suggested the presence of phenols.
Test for Tannins:
2 mL of a 2% FeCl3 solution was mixed in with the extract. The black coloration suggested the existence of tannins.
Test for Terpenoids:
The extract was treated with 1 ml of chloroform. Then, with caution, 2 cc of strong Sulfuric acid was introduced and gently mixed. The presence of terpenoids is indicated by inter-phase reddish brown hues.
Test for Flavonoids:
A vivid yellow colour was created when A few drops of sodium hydroxide solution were added to the extract. When dilute acid is added, it turns colourless, indicating presence of flavonoids.
Test for Glycosides:
Before being placed in the extract was combined with 2 ml of glacial acetic acid containing concentrated sulfuric acids in a tube holding 2 ml of concentrated sulfuric acids a few 2% FeCl3 drops. The presence of interphase, glycosides are represented by a brown ring.
Test for Protein:
When the extract was subjected to a few drops of strong nitric acid, the extract turned yellow, indicating the existence of proteins.
Test for Alkaloids:
To test the presence of alkaloids, the extract was dissolved separately in HCl diluted and the filter was Saturated picric acid treatment.

TITRIMETRIC METHOD FOR INVESTIGATE IN-VITRO ANTI-UROLITHIATIC ACTIVITY TEST:

CaOx kidney stones were created in the lab by combining an equimolar solution of sodium oxalate in 10 ml of 2N H2SO4 and Dehydration of calcium chloride in distilled water. Both were given enough distilled water to react in a beaker, the outcome is calcium oxalate precipitate. It was a precipitate is rinsed with distilled water and dried at 60°C after being freed from any remaining sulphuric acid residues by an ammonia solution. The calcium oxalate dissolving % was estimated by combining 1 gramme of calcium oxalate with 10 gramme of extract in an egg's semi-permeable membrane, as depicted in the diagram below. This was suspended

in a conical flask with 100 cc Tris buffer (0.1M). The first group was a control group that contained merely 1 mg of calcium oxalate. The second category, which included 10mg of Cystone with 1 milligram of calcium oxalate, acted as a positive check. The third and fourth groups both contain ethanol extracts and1 milligrams of calcium oxalate. Conical flasks from every group were warmed within an incubator for two hours to 37 degrees Celsius. Fill separate test tubes with the contents of each group's semi-permeable membranes. Titrate with 0.9494 N KMnO4 until the end point is reached and the hue is deep pink, then 2 ml of 1N is added sulfuric each test tube with acid. Subtract the amount of calcium oxalate that has not been dissolved that remained after the initial run of the experiment to compute the overall amount different solvent extracts of dissolved calcium oxalate.

Fig.2: Egg shell decalcification in 10% acetic acid



RESULTS:

Phytochemical screening reveals the chemical nature of plant extract ingredients and can be used to search for bioactive compounds. The phytochemical tests on the ethanolic extracts of Epiphyllum oxypetalum leaves revealed the presence of a variety of phytochemical compounds, including phenolic compounds, saponins, terpenoids, flavonoids, glycosides, and alkaloids, as well as the absence of tannins and proteins.

Table No. 1: The outcomes of Epiphyllum Oxypetalum Preliminary Phytochemical Analysis

(-) shows the lack of a compound.

(+) shows the presence of a substance.

The antiurolithiatic efficacy of the ethanolic extract

Sr. No.	Constituents	Observation
	Ethanolic Extract	
1	Saponins	+
2	Phenols	+
3	Tannins	-
4	Terpenoids	+
5	Flavonoids	+
6	Glycosides	+
7	Proteins	-
8	Alkaloids	+

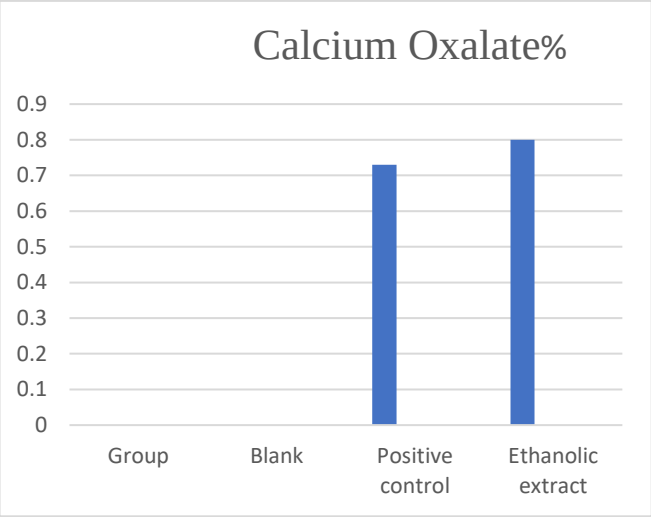
of Epiphyllum oxypetalum is assessed in this study. The ethanolic extract showed the highest rate of calcium oxalate "CaOx" dissolving, 80%. Epiphyllum Oxypetalum ethanolic extracts were discovered to be more efficient at dissolving calcium oxalate.

Table No. 2: % calcium oxalate (CaOx) dissolution by Epiphyllum Oxypetalum leaves extracts

Sr. No.	Groups	Epiphyllum Oxypetalum
1	Blank	0%
2	Positive Management	73%
3	Extract of Ethanol	80%

Drug therapy is now changed as a result of community medical requirements. There are several important medical conditions for which there are no effective treatments in conventional medicine, including liver illnesses, arthritis, issues connected to ageing, some viral infections, and cancer. Given the availability and great potential of plant resources, these are some of the regions of medicine development and research that have the most promise. Plants are also included desirable sources for new product development, highly efficient, and secure therapeutic compounds for the treatment of renal procumbens. Herbal therapies are also included considerable demand for use in basic healthcare in the developed world due to their

effectiveness, safety, and lack of unwanted side effects. In contrast to allopathic drugs, which only target one element of the pathophysiology of urolithiasis, the majority of plant origin therapies have been demonstrated to be beneficial at several phases made of stone etiology. Around 80% of people worldwide depend on traditional medicine, which is largely composed of plant matter.



Graph 1: Urolithiasis percentage of ethanolic extract of Epiphyllum oxypetalum according to their concentration

Plant-based drug development operations are still a significant source of new therapeutic possibilities. Both nephrolithiasis (kidney stone production) and urolithiasis (ureter, bladder, or both stone formation) are kinds of lithiasis, which is a primary cause of acute and chronic renal failure. When it comes to the different types of stones that have been identified, calcium stones mostly affect men, whereas phosphate stones mostly affect women. The antiurolithiatic efficacy of the ethanolic extract of Epiphyllum oxypetalum is assessed in this study. The ethanolic extract showed the highest rate of calcium oxalate "CaOx" dissolving, 80%. Epiphyllum Oxypetalum ethanolic extracts were discovered to be more efficient at dissolving calcium oxalate. This study revealed that calcium oxalate was most effectively dissolved in ethanolic extracts of Epiphyllum oxypetalum. It was discovered that ethanol extract was even more effective at dissolving calcium oxalate. This research has provided first support for Epiphyllum Oxypetalum status as a plant with lithotriptic properties. This in vitro investigation offered valuable information and revealed that ethanol extracts are highly promising in terms of future research in this case field.

CONCLUSION:

Urolithiasis in vitro was carried out on the chosen plant Epiphyllum Oxypetalum using the common drug Cystone. The investigation was done utilising an in vitro antiurolithiatic model to determine the kidney stone's percentage of disintegration.
Epiphyllum Oxypetalum ethanol leaf extract exhibits higher solubility than the benchmark medication Cystone. This study has provided the first solid proof that Epiphyllum Oxypetalum is a plant with antiurolithiatic properties.

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