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CONCISE REVIEW ON NATURE'S CURE FOR KIDNEY STONES- UNVEILING THE POTENTIAL OF SURROUNDING MEDICINAL PLANTS

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ABSTRACT: Kidney stones and renal calculi impact a substantial percentage of the population presently. Urinary stones, also known as calculi, are a very old condition for which numerous treatments have been used over the years. It can be discovered in various areas of the urinary tract, including the kidney, ureters, and bladder with varied size. Frequently caused by calcium oxalate crystals, high uric acid levels, and insufficient citrate levels in the body. This recurrent condition and have reported a 50% lifetime chance of recurrence. The usage of synthetic pharmaceuticals has led to an increased risk of bad drug reactions, which has prompted many to look to nature for safe solutions. Patients are advised to follow a low-fat diet and consume fiber from naturally occurring plants as well as herbal remedies. The current article highlights that herbal medicine, superior to allopathic therapy when it comes to treating kidney and urinary stone disease.

INTRODUCTION: Worldwide, nephrolithiasis, or renal stones, is a prevalent issue. As they become more common, they are placing a heavy financial strain on both developed and economically weakened nations. Stones in the kidneys have been linked to systemic conditions such as overweight, dyslipidemia, elevated blood pressure, and diabetes, especially type 2 diabetes [1]. The problem of urinary stones affects a great deal of people worldwide. There are two main causes of kidney stones: metabolic issues and environmental factors [2]. Renal calculi are becoming more common every day, mostly as a result of dietary, lifestyle, and changes in weight.

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Any age can develop renal stones, although people between the ages of 20 and 49 are said to have the highest incidence [1, 3].

Men Suffer More than Women: The excess calcium and oxalate in urine, which causes abnormal mineralization in the kidneys, is the main cause of nephrolithiasis [4].

The Urinary System and Renal Stone: The kidneys are the primary components of our urinary system and act as the "waste materials treatment plants" of our body. They remove additional materials and poisons from the body that we no longer require. Your body expels these waste materials through the urine that your kidneys make [5]. The kidneys are solid, bean-like organs that are situated in the middle of the back beneath the ribs with the right kidney somewhat lower than the left. Each kidney has a medial concave and lateral convex border. The typical weight of a male is 150 grams, and that of a female is 135 grams.

They are each around 11 cm long, 6 cm wide and 3 cm thick. They are also helpful in maintaining the proper homeostasis balance of other ions and salts in the blood. The narrow urethral tubes convey the urine's composition from the kidneys to the bladder, a chamber with a triangle form. Concurrently, urine is held in the bladder, an elastic balloon-shaped chamber that flattens as urine exits the body through the urethra [6]. A crystal concretion that typically forms inside the kidneys is known as renal stone disease. A growing urological condition impacting human health affects roughly 12% of the global populace. It has been linked to a higher chance of developing end-stage kidney failure [7].

The proximal tubules handle the majority of solute reabsorption, while the distal tubule and collecting ducts handle changes to urine composition. The loop of Henle concentrates urine, which is primarily constituted of water (95%) and urea (2.5%), along with a variety of minerals, salts, hormones, and enzymes. In the proximal tubules, vital nutrients like proteins, amino acids, bicarbonate, calcium, phosphate, and potassium are reabsorbed and returned to the bloodstream together with glucose, salt, chloride, and water. The distal tubule controls the blood's acid-base and salt balance [7]. Stones can be found in several parts of the urinary tract, including the kidneys, ureters, and bladder. The two classes into which kidney stones have been classified are staghorn (which fills several major and minor calyces) and non-staghorn. Non-staghorn stones are primarily pelvic or calyceal in nature, despite the fact that ureteral stones have been documented in the proximal, intermediate, and distal regions. Kidney stones smaller than 5 mm in diameter have the highest chance of passing out on their own, followed by those between 5 and 7 mm, which have a 50% chance. Stones larger than 7 mm, however, seldom pass out on their own and frequently need urological intervention. 90% of kidney stones pass through the urinary tract; as they do, renal colic, or flank discomfort, gets worse. Only 10% of kidney stones require surgical removal [4].

Composition of Kidney Stone: Urinary stones can consist of biological material (the matrix) or crystals and non-crystalline phases. Urinary stones are composed of an organic matrix that includes proteins, lipids, carbohydrates, and glycosaminoglycans (GAGs). These chemicals influence the development of kidney stones by either stimulating or inhibiting those processes. Proteins (64%), non-amino carbohydrates (9.6%), hexosamine as glucosamine (5%), water (10%), and inorganic ash (10.4%) make up the majority of the stone matrix's constituents. Kidney stone assembly involves the use of a matrix as a template. Phospholipids (8.6% of total lipids) make up the matrix of all stones, and this amounts to roughly 10.3% of the stone matrix. Phospholipids in cell membranes influence the development of calcium oxalate and calcium phosphate stones as a component of the organic matrix [8]. The majority of calcium oxalate-formed stones are linked to hypercalciuria and hyperoxaluria [3].

Main Types of Kidney Stones: Kidney stones can be divided into multiple categories based on variations in their composition and etiology.

Calcium Stones: Kidney stones are mostly caused by calcium in conjunction with phosphate, oxalate, and uric acid. Natural sources of oxalate include several veggies, fruits, nuts, and chocolate. Oxalate is also present in high concentrations in some other food sources. The liver uses metabolism to make it as well. An adult in good health should have an oxalate level of 20–40 mg/d [4].

Brushite, also known as hydroxyapatite or calcium hydrogen phosphate, is the primary component of calcium stones. Most kidney stones contain calcium oxalate in the form of CaOx monohydrate (COM, also known as mineral names: weddellite, $CaC_2O_4 \cdot H_2O$) or CaOx dihydrate (COD, also known as weddellite, $CaC_2O_4 \cdot 2H_2O$), or both together, which makes up more than 60% of kidney stones [8]. Crystals of CaOx dihydrate (COD) and monohydrate (COM) are used to make CaOx stones. The most stable form thermodynamically is COM [9]. Compared to other forms of kidney stones, calcium stones are more likely to reoccur.

Calcium Phosphate Stones: Higher calcium and lower citrate concentrations in the urine are two risk variables that are common to both calcium phosphate and calcium oxalate stones. Since, there aren't any randomized trials to provide preventive guidelines for calcium phosphate stone formers at this time, therapies center on altering the known

risk factors. By lowering urinary phosphate excretion, dietary phosphate reduction may have positive effects [1].

Uric Acid Stones: Medications with high purine consumption or high cell turnover (such as cancer) are the most frequent causes of uric acid stones. Gout patients also frequently have these conditions. Urine with a pH of 5.5 or lower is most usually associated with the formation of uric acid stones. About five to ten percent of kidney stones are spherical, smooth, yellow-orange stones composed of uric acid. Unless they have been combined with struvite or calcium crystals, kidney stones appear almost clear on radiography [4, 10].

Struvite or Magnesium Ammonium Phosphate Stones: Struvite stones, commonly referred to as "infection stones," account for 7–8% of all stones globally and are usually brought on by an increase in ammonia production brought on by an infection with urease-producing bacteria like Proteus or Klebsiella. Crystals of magnesium ammonium phosphate hexahydrate are formed as a result of the ensuing alkaline urine [11]. Urine's pH rises to a higher level (usually greater than 7) when urea is split or cleaved into ammonia and CO2. Since phosphate is less soluble at alkaline pH than in acidic pH, it precipitates onto the insoluble ammonium compounds, resulting in the production of a sizable staghorn stone. This kind of stone is more common in women than in men. Escherichia coli is not linked to struvite stones and is incapable of breaking urea [7].

Cysteine Stones: Of all stone types, these stones make up less than 2%. It is a hereditary condition that affects cystine and amino acid transport. Urinary excretions exhibit an excess of cystinuria as a result.

A genetic intrinsic metabolic disorder called cystinuria causes cystine re-absorption in the renal tubule to be hindered, ultimately leading to the formation of cystine stones. These stones could be hard to spot on X-rays due to the high sulfur content. When drugs are used to generate stones, several medications can cause renal stones [8, 10].

Drug-induced Stones: Kidney stones appear to be more common in patients treated for gout, including those prescribed with benzbromarone, salicylic acid, and probenecid. Medications with poor solubility, high excretion rates, or high doses that start the crystallization process and raise the risk of renal calculi, such as indinavir, atazanavir, sulphonamides, ceftriaxone, *etc*., are used for long-term treatment [12].

Mechanism of Kidney Stone Formation:

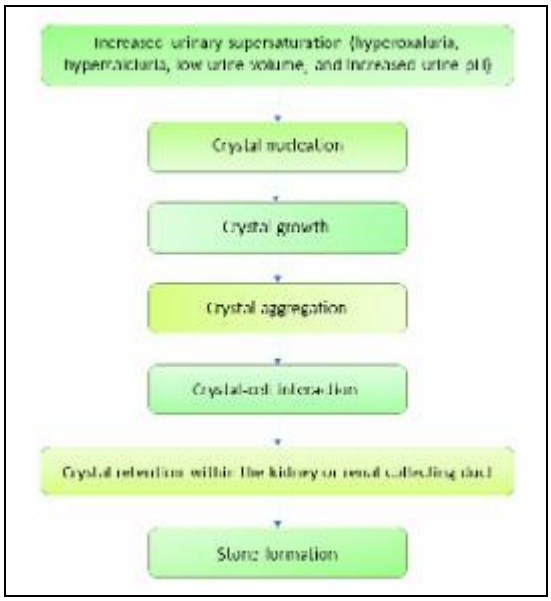

FIG. 1: MECHANISM OF KIDNEY STONE FORMATION [4]

Urine supersaturation and physicochemical alterations are two biological processes that lead to renal stone development. A supersaturated solution has more dissolved material in it than the solvent could normally dissolve. Supersaturation causes solutes to precipitate in urine, which triggers nucleation and the formation of crystal concretions. In other words, crystallization happens when two ions' concentration in the solution rises above their saturation level [7].

Supersaturation, the thermodynamic driving force, and rate-controlling kinetic processes, which are involved in the crystallization of the different stone-forming minerals, are influenced by an unusual combination of components that make stones. The degree of supersaturation of the fluid in which initiation occurs is the primary thermodynamic driving force for both stages [11].

Regarding the mineral phase of stone production, all stones undergo comparable occurrences. However, depending on the kind of stone and the chemistry of the urine, several steps take place

before a stone forms. For example, calcium-based stones (calcium phosphate or calcium oxalate) crystallize in supersaturated urine when inhibitor concentrations are low. Calcium oxalate's solubility is disrupted by uric acid, which encourages the production of CaOx stones. When inhibitory compounds resist the crystallization process in healthy controls, the procedure becomes safe. The nucleation, growth, aggregation, and retention of crystals inside the kidneys are the sequential events that cause stone development [8].

Phases of Stone Level Development:

Crystal Nucleation: In a solution, nucleation is the process by which a solid crystal phase forms. It is a crucial stage in the development of renal stones. A solution is said to be supersaturated if it contains more of the dissolved substance than the solvent could normally dissolve [9]. Free atoms, ions, or molecules in a supersaturated liquid begin to form microscopic clusters, which precipitate when the bulk free energy of the cluster is less than that of the liquid. Fixed and free particle mechanisms can result in the formation of nucleation in the mechanism. When promoters outnumber inhibitors in supersaturated fluids, nucleation begins [7]. This reaction takes place inside containers with chemically active cell surfaces and can be triggered by particles made of proteins, other organic polymers, or crystals of another mineral. When it comes to the start of crystals, heterogeneous nucleation necessitates less supersaturation than homogenous nucleation [11].

Crystal Growth: Urine crystals adhere to one another to produce crystal growths, which are tiny, hard masses of stone. The process of aggregating preexisting crystals or subsequent nucleation of crystals on the matrix-coated surface allows for the formation of stones [7]. The formation of a stone nucleus can occur by either of the two fundamental pathways (free-particle and fixed-particle mechanisms), which can both be active in any stone former; however, stones from idiopathic stone formers typically form connected to plaque [11]. In a supersaturated liquid, several atoms or molecules begin to form clusters; the bulk free energy of the cluster is lower than the liquids. Surface energy, or surface tension, raises the cluster's total free energy; nevertheless, this is only important for small clusters. The size, shape, and physical characteristics of the molecule, as well as the pH, SS levels, and potential structural flaws in the material, all influence crystal formation. One of the requirements for particle production is crystal development. Using the powerful atomic-force microscope (AFM), Laboratory researchers are uncovering intricate development mechanisms and three-dimensional architectures of solution-based crystals [9].

Crystal Aggregation: Aggregation is the process by which a little hard mass of a crystal in solution adheres to one another to form a bigger stone. All CaOx urolithiasis models acknowledge crystal aggregation as most likely playing a role in kidney crystal retention [7]. The critical phase in the production of stones is crystal aggregation.

Crystal-cell Interaction: Crystal-cell contact is the phrase used to describe the connection of growing crystals with the epithelial cells lining the renal tubules. Crystals travel from the basolateral side of cells to the basement membrane due to crystal-cell contact. Alternatively, crystals may enter cells and become anchored to the kidneys' basement membrane. One important early event in the development of nephrolithiasis may be the contact of COM crystals with the surface of renal epithelial cells. CaOx crystallization is facilitated by an enhanced retention force between the crystal and damaged renal tubule epithelial cells. It is believed that the majority of crystals affixed to epithelial cells are broken down by macrophages and/or lysosomes within the cells, after which they are expelled with urine [7].

Crystal Retention: Crystal formation, retention, and accumulation in the kidney are necessary steps in the process of urolithiasis. When crystals stick together with the cells that line the renal tubules, it can lead to crystal retention. The primary factor influencing crystal formation is the composition of the tubular fluid; the surface composition of the renal tubular epithelial cells may have an impact on crystal retention. The distal tubules, collecting ducts, ureters, bladder, and urethra all include non-adherent surfaces that act as a natural defense against crystal retention. These surfaces can develop defects if their anti-adherence qualities are weakened. Verhulst *et al.* found that hyaluronic acid-dependent cell coat creation and increased

expression of hyaluronic acid, osteopontin, and their receptor CD44 on the cell surface in a cell culture model. These findings raise the possibility that hyaluronic acid plays a significant role in crystal retention [9].

Signs and Symptoms: Numerous symptoms, including fever, vomiting, loin pain, and entirely asymptomatic states, can be associated with urolithiasis [13]. Severe pain and symptoms occur when the stone moves towards the ureters.

Symptoms of renal calculi include:

1. Chills
2. Fever
3. Vomiting
4. Blood in urine sample
5. A sudden urge to urinate
6. Burning sensation during urination

Risk Factors: The following are the risk factors of renal calculi:

1. Kidney stones can be inherited between generations. A genetic disorder called cystinuria increases the risk of developing cystine stones.
2. Obesity
3. Hypertension
4. Struvite stones are more common in patients with kidney infections (especially in women) and urinary tract infections (UTIs) than in patients with other illnesses.
5. Metabolic syndrome can lead to the development of kidney stones.
6. Adding additional proteins, lipids, sodium, and sugar to your diet may raise your risk of kidney stones.
7. Disorders related to metabolism: hypercalciuria, hypocitraturia, hyperoxaluria, hyperuricosuria, and gout history (inadequate uric acid metabolism).
8. Lifestyle choices and nutritional/dietary factors: consuming too much salt and animal protein, as well as lacking in chelating substances like citrate, fiber, and alkali foods.
9. Seasonal differences (greater in summer than winter), occupation, geographic conditions, and climate change (global warming).
10. Uricosuric agents, which are poorly soluble and encourage the development of calculi, and ceftriaxone (high dose over an extended period of time)
11. Genetic vulnerability to stones, genetic monogenic diseases (single aberrant gene disorders on the autosomes), and renal tubular acidosis are examples of hereditary disorders and genetic predispositions [8, 10].

Treatments through Allopathic Medicines: Kidney stone prevention requires more than just changing one's diet and drinking more water. To remove created stones from the body, doctors should administer the medication. The optimum treatment can be chosen based on the urine's kind, size, and irregularities. The following list includes the drugs used to remove stones [14].

Thiazide Diuretics: Patients who have kidney stones or a high level of calcium in their urine can benefit from thiazides. These medications support the kidneys' ability to eliminate excess calcium from the body and stop the development of calcium stones by preventing their return to the bloodstream. When combined with a controlled amount of salt consumption, thiazides can be helpful in maintaining a low-sodium diet [15].

Potassium Citrate: When a patient has low urinary citrate and is suffering from calcium, cystine, or uric acid stones, potassium citrate is used to reduce the acidity of their urine.

Urine that contains potassium citrate is more basic and alkaline. This characteristic aids in the prevention of uric acid and cystine stones. Additionally, there was an increase in the urine's citrate level, which aids in preventing the formation of calcium stones [14].

Allopurinol: When used to treat gout, allopurinol raises blood levels of uric acid, which then builds up in the joint cavity. reduces the elevated levels of uric acid in the urine and blood. It is also recommended to avoid kidney stones caused by uric acid and calcium [15].

Acetohydroxamic Acid (AHA): Acetohydroxamic acid is prescribed to patients with struvite stones or urinary tract infections. Recurrent urinary tract infections may cause this kind of stone formation. Urine diluted with AHA can be less conducive to the development of struvite stones. Recurrent urinary tract infections (UTIs), which are brought on by certain types of bacteria, are inhibited in order to prevent struvite stones. Surgery can remove the stones entirely [14].

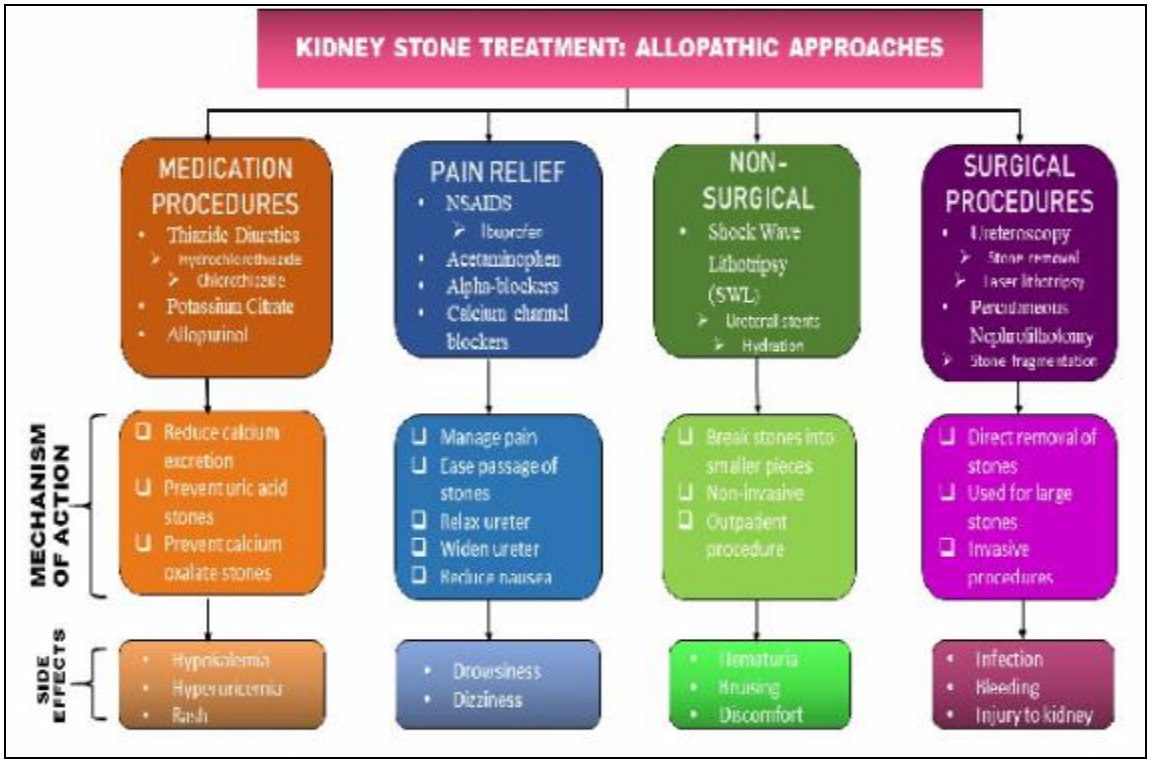

FIG. 2: REPRESENTATION OF ALLOPATHIC APPROACHES FOR KIDNEY STONE TREATMENTS. The following provides an overview of kidney stone therapies using allopathic medications.

Drawbacks of Allopathic Treatments:

1. Adverse Effects: Painkillers and alpha-blockers, which are medications used to treat kidney stones, might have adverse effects including nausea, vertigo, and gastrointestinal problems.

2. Recurrence: Rather than avoiding the growth of new stones, allopathic treatments frequently concentrate on eliminating preexisting ones. If underlying causes are not addressed, this can result in recurrent kidney stones.

3. Cost: Because surgery and continuous medication can be expensive, some people may not be able to afford allopathic therapies.

4. Invasive procedures: Extracorporeal shock wave lithotripsy (ESWL) and ureteroscopy are examples of invasive treatments that might cause consequences such as bleeding, infections, and tissue damage.

Herbal Treatments for Kidney Stones: Many medications are used to prevent the frequency of hypercalciuria and hyperoxaluria, which lead to the production of calculi. Thiazide is one such medication that is used as an alkali citrate and diuretic, but its limited effectiveness and poor tolerability make it less promising. Researching novel pharmacological treatments for kidney stones is important due to the drawbacks of surgical methods and the lack of options in pharmacotherapy.

Many therapeutic plants that have antioxidant, diuretic, and antispasmodic properties also inhibit crystal nucleation, aggregation, and crystallization, which makes them effective in the treatment of urolithiasis [9]. In the last several decades, a number of treatment solutions for urinary stone diseases have been discovered. However, because most of these treatments involve surgery, they are frequently expensive and unavailable. Because of this, many people only have access to or prefer

traditional herbal remedies, like Ayurveda, to treat renal stones [10]. Herbal remedies contain a variety of phytoconstituents and work to treat urolithiasis through a variety of methods, including:

- Maintain equilibrium between the urine's crystallization promoter and inhibitor, which influences the crystal's nucleation, aggregation, and growth (the action known as crystallization inhibition).
- Keeps urinary calculi from recurring by controlling the imbalance of crystalloid-colloid and enhancing renal function.
- Regulation of oxalate metabolism.
- Reduces the mucin that binds calculi (lithotriptic action).
- Inhibits the recurrence of urinary calculi by regulating the imbalance of crystalloid colloid and enhancing renal function.
- Demonstrates a strong anti-infective effect against the main causing organisms (Antimicrobial activity) [16].

TABLE 1: LIST OF MEDICINAL PLANTS USED IN THE TREATMENT OF RENAL CALCULI

Sr. no.	Plant	Family	The usable part of the plant	Use	Ref.
1	*Acorus calamus* L.	Araceae	Rhizomes	The rhizomes of plants possess diuretic properties.	17
2	Barberry rootbark (*Berberis vulgaris*)	Berberidaceae	Roots, Bark	Inhibit the crystallization of calcium oxalate and shield the kidneys from oxidative stress-related damage.	15
3	Beetroot (*Beta vulgaris* L. *Ullam gadda*)	Amarantrhaceace	Rhizome	Juice from rhizomes for seven days to treat kidney stones.	15
4	Black cumin seed (*Nigella sativa*)	Buttercupes	Seed	Protected test animals against experimentally induced formation of calcium oxalate stones.	15
5	*Chanca piedra* /Stonebreaker (*Phyllanthus niruri*)	Phyllanthaceae	Entire plant	Consuming this herb regularly helps to prevent kidney stone formation in a number of in vitro and animal trials.	14
6	Corn silk (*Zea mays*)	Poaceae	Silk fiber	It is used to treat kidney stones and acts as a diuretic.	18
7	Cotton tree (*Bombex ceiba*)	Bombacaceae	Stem and bark	Given for urinary problems.	18
8	Dadamari (*Ammannia baccifera*)	Lytharaceae	Root	Used as diuretic.	18
9	Dog's tooth grass (*Cynodon dactylon* L.)	Poaceae	Roots	Root decoction is given in the case of urolithiasis.	18
10	Evening primrose (*Oenothera biennis*)	Onagraceae	Seed	Prevent the development of calcium oxalate stones in test animals.	10
11	Fenugreek seed (*Trigonella foenum-graecum*)	Fabaceae	Seed	Seed significantly reduced calcification in the kidney and helped prevent kidney stones.	15
12	Fig (*Ficus carica*)	Moraceae	Fruits and latex	Destroy kidney stones.	18
13	Gokharu fruit/root (*Tribulus terrestris*)	Zygophyllaceae	Roots	Protects against calcium oxalate-induced renal injury.	15
14	Golden shower tree (*Cassia fistula* L.)	Caesalpinioideae	Fruits	For 3–4 months, fruit powder is administered with water to help kidney stones pass.	18
15	Green tea (*Camellia sinensis*)	Theaceae	Leaves	Reduce the amount of calcium oxalate that is excreted in the urine and the activity of the enzyme sodium oxide dismutase (SOD).	15
16	Gulgul (*Commiphora wightii*)	Burseraceae	Extract	Decreases Growth and the size of the struvite crystals.	15

17	*Hairy bergainia* (Bergenia ciliate Haw.)	Saxifragaceae	Rhizome	Nucleation and aggregation of COM crystals decreases the number and size of COM crystals.	[15]
18	Hairy Rupture (*Herniaria hirsuta* L)	Caryophyllaceae	Aerial parts and roots	Decreases the size and supersaturation rate of crystals.	[15]
19	Indian mallow (*Abutilon indicum*)	Malvaceace	Seed and leaf	The extract is given for urinary disorders.	[18]
20	Keukand (*Costus speciosus*)	Costaceae	Tubers	Decoction of tubers orally for stones.	[18]
21	Khella (*Ammi visnaga* L.)	Umbellifers	Fruits	Decreases the calcium oxalate crystal deposition.	[15]
22	Kuntze (*Tubiflora acaulis*)	Acanthaceae	Leaves	Leaf powder is given with water for urinary complaints.	[18]
23	Oregano (*Origanum vulgare* L.)	Mints	Aerial part	Preventing loss of body weight, polyurea, crystalluria, and oxaluria increases rum urea and creatinine levels.	[15]
24	Panfuti (*Bryophyllum pinnatum*)	Crassulaceae	Leaves	Used to treat kidney stone problems.	[18]
25	Parsley (*Petroselinum sativum* Hoffm.)	Umbellifers	Aerial parts and roots	Decreases the number of calcium oxalate deposits.	[15]
26	Pashanbedha (*Bergenia ligulata*)	Saxifragaceae	Rhizomes	Diuretic action.	[18]
27	Plum cockscomb (*Celosia argental*)	Amaranthaceae	Extract	Aqueous decoction is used for the dissolution and excretion of stones.	[10]
28	Punarnava (*Borhhavia diffusa*)	Nyctagenaceae	Root	Root decoction is given daily for one month in kidney stones.	[18]
29	Raspberry (*Rubus idaeus*)	Rosaceae	Aqueous extract	Protein carbonyls and malondialdehyde (MDA) production diminished. The growth rate of calcium is slowed down by urinary phosphorus and calcium levels.	[15]
30	Roselle (*Hibiscus sabdariffa* L.)	Malvaceae	Extract	Induced hyperoxaluria decreases the Deposition of stone-forming constituents in the kidneys.	[15]
31	Shatavari root (*Asparagus racehorses*)	Liliaceae	Roots	Prevent the development of calcium oxalate stones in test animals.	[15]
32	Tridax daisy (*Tridex procumbens* L.)	Asteraceae	Leaves	Kidney stones are treated using leaf paste.	[15]
33	Varuna bark (*Crataeva nurvala*)	Capparadiaceae	Stem and bark	Helped to dissolve renal calculi	[14]
34	Wild carrot (*Daucus carota*)	Apiaceae	Rhizomes	one glass juice is given for night to remove kidney stone	[18]
35	Wood apple (*Aegle marmelose* L.)	Rutaceae	Leaves and fruits	Kidney stones are dissolved by taking one spoonful of fruit pulp powder orally along with coconut milk for fourteen days.	[18]

CONCLUSION: The problem of kidney stones is still getting worse. Numerous factors, including metabolic, environmental, and dietary factors, influence the production of kidney stones. A deeper comprehension of the illness has resulted from advancements in diagnostic methods. Currently, popular methods for treating kidney stones include surgery to remove the stones or the use of allopathic and natural medications. Although herbal remedies are the most affordable and safest available, their effects take time to manifest. However, the majority of patients favored using herbal therapy to get rid of kidney stones.

In this article, the effects of several plants that have been suggested for use in the prevention and treatment of kidney stone development have been thoroughly studied. A variety of medicinal plants are primarily assessed with kidney stone types that are caused by calcium oxalate and magnesium ammonium phosphate. In terms of stone illnesses, medicinal plants are essential. People's focus has already shifted toward natural remedies due to the unfavorable effects of modern treatment. It is imperative to build faith and trust in the safer indigenous system by proving its efficacy in treating a range of illnesses to raise acceptance and

awareness among the populace. The increasing cost of health care systems necessitates the introduction of herbal medicine systems. Let's hope that in the future, natural products can rival contemporary medications with the added benefits of increased safety and reduced costs. In this article, an effort has been made to highlight the use of medicinal plants which are easily available in our surroundings as a treatment for urinary stones.

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