

Various Curative Herbs Used As Lithotropic: A Review

Rahul Jodh, Mukund Tawar, Sudarshan Behere, Tanvi Raut, Swaraj Wankhade,
Chaitali Thotange

Department of Pharmacology, P.R. Pote Patil College of Pharmacy, Amravat-444602

Submitted: 01-07-2022

Accepted: 08-07-2022

ABSTRACT:

More than 80 percent of the world's population now relies on plant-based medicines. Apart from synthetic medications, herbs also possess medical characteristics due to their active ingredients, which have been shown to be more useful and to have fewer or no negative effects. On the other hand, the widespread use of synthetic medications has fueled interest in natural therapies. Kidney stones, or calculi, are the most prevalent and painful illness in today's population. Any part of the urinary system, including the kidney, ureter, and bladder, can be affected by urinary stones. The various causes of renal calculi include mineral deposits, infections, and genetic factors. This can result in uremia, pyelonephritis, and renal failure, among other complications. The current study has placed a premium on the importance and potential of herbal alternatives for urinary or renal stones.

Keywords: Kidney stone, Urinary calculi, Antiurolithiasis, Renal calculi, Herbal Medicine.

I. INTRODUCTION:

Kidney stone illness, commonly referred to as urolithiasis, is one of the earliest diseases recognized by medical practitioners. It is estimated that between 1% and 15% of people will develop kidney stones during their lifetime. Renal stone disease affects about 12 percent of the world's population and has a recurrence incidence of 70–80% in men and 47–60% in females. Without adequate treatment, kidney stones can obstruct the urethra, result in blood in anuresis, cause vomiting, painful urination, and urinary tract infections, ultimately resulting in permanent kidney failure. According to some research, an increase in the incidence of kidney stones is projected as a result of a variety of environmental factors, including changes in food habits and secondary lifestyle, as well as global warming. However, the precise mechanisms underlying the increasing occurrence and reappearance of urinary stones remain unknown. The four most common minerals found

in kidney stones are calcium oxalate (Calcium Oxalate; 65.9%), carbapatite (15.6%), urate (12.4%), struvite [(NH₄MgPO₄), 2.7%), and brushite (1.7%)⁽¹⁾.

Calcium-containing and calcium-free kidney stones are the most common types. Calcium oxalate and calcium phosphate, which are calcareous and radiopaque stones, respectively, are the most prevalent types of kidney stones in humans. Males are more likely to develop calcium oxide and urate stones, whilst females are more likely to develop carbapatite and struvite stones. Kidney stones cause a variety of symptoms depending on where they are placed in the kidney or ureter. At first, there are no signs of kidney stone production. Renal colic, flank discomfort, hematuria, urinary tract infections, urine flow restriction, and hydronephrosis are among the symptoms that can be caused by urinary tract stones. These disorders may cause nausea and vomiting, as well as pain associated with the stone occurrence. Thus, therapy and time away from work incur considerable costs, wreaking havoc on both the individual's quality of life and the national economy.⁽²⁾

Laser Treatment for Kidney Stone

For the first time in two decades, someone discussed how to use a Holmium laser in urology. The Holmium laser was used to break up urinary stones after being investigated as a new instrument for tissue ablation with good hemostatic qualities. The Holmium laser has a number of significant advantages over typical lithotripsy treatments.

1. The ability to shatter any type of urinary stone into small stones.
2. The ability to use ultra-thin and flexible delivery fibers with low energy loss, as well as core sizes as small as 200 m with low energy loss.
3. Because of its relatively high absorption coefficient, holmium has a favorable safety

profile, with a shallow penetration depth and little chance of unwanted cell harm.

4. Its ability to employ a Holmium: laser system on soft tissue in addition to stone removal is one of its most notable features.

The Holmium: laser is gold std. for laser kidney stone in flexible ureteroscopy. The user can change the laser's pulse energy and frequency. Low-pulse Holmium: lithotripsy has recently gained popularity among urologists.⁽³⁾ Because this configuration appears to achieve very fine stone fragmentation (stone dust), no time-consuming stone fragment gathering is required. High-frequency Holmium: generators with low-pulse energy settings are optimized for faster stone breakup. Despite these advances, the size of stones that can be treated using ureteroscopic laser lithotripsy is presently limited.⁽⁴⁾

Herbal Drugs as Lithotropic

Due to the widespread use of synthetic pharmaceuticals, which have a higher rate of ill effects than natural ones, there is renewed interest in traditional treatments. Using herbs and herbal remedies has helped people reconnect with nature in their search for healthy answers. Approximately 80 percent of people around the world, according to the WHO, use herbal medicine to help with some of their basic health care requirements.⁽⁵⁾ Numerous current medicinal remedies, such as surgical techniques, shock waves, and medications, are available to treat this disease, but they are prohibitively expensive and associated with a plethora of adverse effects. It's important to show an interest in traditional herbal medicines, which are generally considered safe and without difficulty. They should also be inexpensive, readily available, and accessible. In ancient Vedic literature, stones are referred to as Ashmari. A considerable proportion of India's population suffers from urinary tract and kidney stones caused by calcium, phosphate, and oxalates deposits. It is required to identify any new or lesser-known medicinal plants that may contain novel bioactive chemicals with therapeutic promise.⁽⁶⁾

Medicinal Plants Recommended for the Treatment of Kidney Stone

1) Bryophyllum pinnatum (Crassulaceae): This plant is used in traditional medicine in tropical India, the United States, China, Africa, and Australia. Flavonoids, steroid, alkaloid, bufadienolides, and glycosides, as well as lipids and organic acids, have all been discovered in the

plant. CNS depressants, anti-inflammatory, antimicrobials, analgesics, antiallergic, antileishmanial, antianaphylactic, antiulcerous, antitumorous, antibacterial, antifungal, febrifuge, gastroprotective, insecticidal, immunosuppressive, muscle relaxants have all been discovered in this plant.⁽⁷⁾ In Ayurveda, the plant is also called Pabheda, which translates as "stone dissolver." Bryophyllum pinnatum leaves are extensively used in traditional and ethnomedicinal medicine to treat urinary insufficiency and stone diseases.⁽⁸⁾

2) Alhagi mannifera (Leguminosae): This plant has been found in a variety of places throughout Iran, including the north and central deserts, as well as Saudi Arabia, North Africa, Syria, Turkmenistan, Iraq, and Central Asia. Bioactive and pharmaceutically active compounds such as flavone glycosides, flavonoids, Alhagitin Alhagidin, proanthocyanidins, tannins, and triterpenes were discovered in the Alhagi phytochemical inquiry. According to traditional medicine, alhagi has a very hot and dry character. It also acts as a diuretic, which makes the kidneys less likely to spasm. It has been used for a long time to treat kidney stones and urinary tract stones⁽⁹⁾.

3) Amaranthus viridis (Amaranthaceae): Amaranthus viridis is widespread throughout the world's tropical and subtropical climates, as well as in upland rice. It grows best in well-drained open waste areas or farmed land, preferring sandy or humus-rich soils. Amaranthus viridis includes carbohydrates, proteins, calcium, iron, phosphorus, magnesium, potassium, sodium, and zinc, as well as the vitamins riboflavin, thiamine, and niacin, as well as flavonoids such as rutin and quercetin. The roots of Amaranthus viridis contain sterol, which is used to treat snake bites, while the leaves include fatty acids such as palmitic acid, carotenoids, and amino acids. Amaranthus viridis has traditionally been used as an anti-inflammatory, vermifuge, diuretic, antirheumatic, antiulcer, analgesic, antiemetic, laxative, and antileptotic, as well as for respiratory difficulties, eye therapy, asthma, and antiviral actions. To relieve pain and fever, the entire shrub is used.⁽¹⁰⁾ The herb Amaranthus viridis has been demonstrated to help with kidney stone treatment.⁽¹¹⁾

4) Abutilon indicum (Malvaceae): The plants can be found throughout Marathwada, but they are most common in the Mahur range woodlands, farmed fields, grassland, and wasteland. The rustics and tribal people of the Mahur range forest utilize the plant in traditional medicine to cure bronchitis,

diarrhoea, bladder inflammation, chronic inflammation of the urethra and urinary bladder, and other ailments. The leaves have therapeutic properties that are used to treat rheumatism, urinary tract infections, kidney stones, dental issues, toothaches, piles, TB, stomachaches, and other conditions. *Abutilon indicum* contains flavonoids, tannins, and saponins. There were, however, no alkaloids, glycosides, terpenoids, phlobatannins, anthraquinones, reducing sugars, or cardiac glycosides discovered. *Abutilon indicum* is used to cure kidney stones. The *Abutilon indicum* leaf juice is effective for the treatment of kidney stones when taken twice daily for two weeks.⁽¹²⁾

5) *Barbarea vulgaris* (Brassicaceae): It grows in temperate and semitropical climates throughout South America, Europe, North America, Asia, and Africa. The different organs of this plant contain a range of alkaloids, the most prominent of which is berberine. This alkaloid possesses anti-oxidant, anti-inflammatory, hypoglycemic, hypotensive, and hypolipidemic effects. Fever, cough, depression, hyperlipidemia, hyperglycemia, and bleeding are all treated with *Barbarea vulgaris*. It is used to treat renal calculi, also known as kidney stones. Additionally, it is used to alleviate abdominal pain caused by kidney stones. Additionally, it aids in the improvement of renal function, which aids in the treatment.⁽¹³⁾

6) *Bergenia ligulata* (Saxifragaceae): For ages, the plant has been utilised in South Asia, especially Pakistan and India, to treat a range of diseases. *Bergenia ligulata* is used to treat dysuria and strangury, as well as kidney and ureter stone formation. Several early investigations have been conducted to determine the rhizome of *Bergenia ligulata*'s antirolithic potential. In vitro, *Bergenia ligulata* rhizome aqueous extract inhibited the homogeneous precipitation of CaC_2O_4 crystals as well as the formation of CaC_2O_4 and CaHPO_4 dihydrate crystals. In in vivo studies, *Bergenia ligulata* alcoholic extract was found to be effective in dissolving calculi produced in rats' bladders after foreign body insertion and in decreasing idiopathic hyperoxaluria in stone formers. It has potent diuretic and lithotriptic effects.⁽¹⁴⁾

7) *Bombex ceiba* (Bombacaceae): Thailand, Myanmar, Malaysia, Vietnam, Indonesia, the Philippines, Taiwan, and southern China are among the nations where the tree is frequently planted. *Bombex ceiba*'s root, stem, fruit, flower, and leaves have all been discovered to contain alkaloids, phytosterols, glycosides, and triterpenoids, proteins, phenolic substances such as naphthalene

derivatives, mangiferin, shaminin, kaemferol, and quercetin and tannins. *Bombex ceiba* extracts have been widely researched for a variety of possible applications, including moderate oxytocic and heart stimulant activity, hypotensive and hypoglycaemic activity, analgesic, and antioxidant activity. The dried immature fruits of *Bombex ceiba* are used to treat calculus, chronic inflammation, and ulceration of the bladder and kidneys.⁽¹⁵⁾

8) *Boerhaavia diffusa* (Nyctagenaceae): This plant is found in India, the Pacific, and the southern United States. Numerous rotenoids are found in the roots of *B. diffusa*. Punarnavoside, a phenolic glycoside, C-methyl flavone, potassium nitrate (6.0%), and ursolic acids are also present. *Boerhaavia diffusa* was found to provide significant protection against kidney illness and urolithiasis. *Boerhaavia diffusa* has also been observed to have regenerating benefits for the kidneys. *Boerhaavia diffusa* induces diuresis and accelerates the process of dissolving the crystalline crystals, aiding in the stone's mechanical evacuation. Additionally, it enhances renal function by enhancing waste product clearance and lowering oxalate excretion, most likely through interfering with metabolism.⁽¹⁶⁾

9) *Blumea balsamifera* (Asteraceae): The plant is widespread throughout Asia's tropical and subtropical regions, most notably the Indian Subcontinent and Southeast Asia. Saponins, alkaloids, flavonoids, and terpenoids were all present in the plant. The absorbance of artificial urine crystallising solutions was found to be reduced by *Bergenia ciliata* rhizome extract. A decoction of *Blumea balsamifera* leaves is used to treat kidney stones and is said to have anti-lithogenic effects.⁽¹⁷⁾

10) *Cucumis sativus* (Cucurbitaceae): Cucumbers originated in South Asia but are now found on all continents. It is a widespread creeping vine plant belonging to the Cucurbitaceae family that bears cylindrical fruits that are consumed as vegetables. Analgesic, antiinflammatory, antiulcer, antidiabetic, and hepatoprotective activities have been discovered in *Cucumis melo*. It has historically been used to treat hypertension and maintain renal function. Additionally, its seeds have been used to induce oliguria, scorching micturition, as a diuretic, and as a lithotriptic. *Cucumis sativus* is capable of degrading calcium oxalate kidney stones (CaC_2O_4)⁽¹⁸⁾.

11) *Pimpinella anisum* (Umbelliferae): This is one of the earliest species grown by humans, having originated in Egypt and was then spread to

Greece, Rome, and the Middle East. The plants included trans-anethole (93.9 percent) and estragole (2.4 percent). At concentrations greater than 0.06 percent, (E)-methyleugenol, -cuparene, -himachalene, -bisabolene, p-anisaldehyde, and cis-anethole were also found. It is extensively used to treat digestive issues symptomatically, including epigastric, bloating, sluggish digestion, belching, and flatulence. However, few studies have demonstrated *Pimpinella anisum* L.'s positive effect on renal function, particularly against nephrotoxicity caused by heavy metals.⁽²⁰⁾

12) *Pedaliium murea* (Pedaliaceae): This perennial herb grows along the beaches of Sri Lanka, South India, Mexico, Ceylon, and tropical Africa. A plant's therapeutic value is derived from certain chemical compounds (phytochemicals) that exert a specific physiological effect on the human body. Alkaloids, flavonoids, tannins, and phenolic compounds are the most abundant bioactive chemicals in plants.⁽²¹⁾ The plant *Pedaliium murex* was utilised to dissolve and prevent the formation of kidney stones. It's also used to treat urinary incontinence, gonorrhoea, lochial discharge increase, antibilious agents, dysuria, and white discharge control. The entire plant can also be used to treat urinary problems, diuretics, infertility in men, and leukorrhoea. Leucorrhoea, urinary tract troubles, lumbago, joint soreness, gonorrhoea, and bladder disorders were all treated using this plant's seed in the past.⁽²²⁾

13) *Phyllanthus niruri* (Euphorbiaceae): *Phyllanthus niruri* is a tropical plant that is commonly found in coastal areas. It is also known as "gale of the wind," "stonebreaker," and "seed-under-leaf." It contains lignans, triterpenes, flavonoids, sterols, alkaloids, and essential oils, among other phytochemicals. It has been utilised in Ayurvedic medicine for more than 2,000 years, and its traditional uses include internal treatment for jaundice and gonorrhoea, as well as regular menstruation and diabetes, as well as topical treatment for skin ulcers, sores, swelling, and irritation. According to Brazilian traditional medicine, patients with urolithiasis can benefit from this treatment. The compound promoted stone removal and inhibited the formation of stones in a rat experimental model of calcium oxalate lithiasis. Despite the fact that numerous studies have demonstrated the therapeutic effects of *Phyllanthus niruri*, as well as its potential to suppress the production of kidney stones, clinical trials on the plant are still lacking.⁽²³⁾

14) *Terminalia arjuna* (Combretaceae): Arjun is a plant that naturally grows in deep forests and is known for its medicinal properties. The practise is extremely widespread in Baitul, Madhya Pradesh, as well as Dehradun, Uttarakhand. Arjun can be effectively cultivated from seed or from stumps, depending on the situation. According to the USDA, arjun contains about 15% tannins. Arjunolic acid, triterpenoid saponin, and arjunic acid are among the substances found in it. Studies on *Terminalia arjuna* have also been undertaken in order to support the plant's diuretic qualities. This research found that an aqueous extract of *Terminalia arjuna* bark might protect liver and renal tissues from CC14-induced oxidative stress by increasing anti-oxidative defence activities. Its aqueous extract protects against hepatic and renal damage caused by carbon tetrachloride exposure. The dangers of surgical treatment of kidney stones should be weighed against the tremendous therapeutic efficacy of *Terminalia arjuna*, which has a high concentration of polyphenols and flavonoids.⁽²⁴⁾

15) *Tinospora cordifolia* (Menispermaceae): Because it is noncontroversial and universally recognised, *Tinospora cordifolia* is one of the most commonly used herbs in Ayurvedic medicine. It belongs to the Menispermaceae plant family. *Tinospora cordifolia* contains alkaloids, sesquiterpenoids, glycosides, steroids, phenolics, diterpenoid lactones, aliphatic chemicals, and polysaccharides, among other chemical components.⁽²⁵⁾ Analgesic, rejuvenator, astringent, anthelmintic, antiarthritic medication, antiperiodic medication, antipyretic medication, antibiotic medication, antimalarial medication, anti-inflammatory medication, aphrodisiac medication, anti-asthmatic medication, bitter tonic medication, carminative medication, cardiotoxic medication, constipative medication, digestant medication, diuretic medication, expectorant medication, anti-diabetic medication, Several studies have suggested that *Tinospora cordifolia* may have antidepressant, antistress, learning and memory enhancing, antioxidant, hepatoprotective, antidiabetic, antiulcer, hypolipidemic, antiinflammatory, antiallergic, antifertility, antiischemic, immunomodulatory, and anticancer properties, among other things. *Tinospora cordifolia* is a plant that is native to the Mediterranean region. As well as being diuretic, it is said to have anti-stone properties that can be achieved by increasing total fluid intake and output. These properties have been attributed to a number of herbal remedies. As a

result of the research described above, *Tinospora cordifolia* has been chosen for its antiurolithiatic activity.⁽²⁶⁾

16) *Tamarindus indica* (Caesalpinioideae): On the Indian subcontinent, it is one of the most significant multipurpose tropical fruit tree species, as well as one of the most extensively planted. The fruit of the Tamarind palm was originally thought to be produced by an Indian palm, according to the term "Tamarind," which comes from the Persian phrase "Tamar-I-hind," which means "date of India." When examining *Tamarindus indica*, researchers discovered phenolic compounds, tartaric acid, mallic acid, cardiac glycosides, mucilage, pectin, arabinose, xylose, galactose, glucose, and uronic acid, among other active substances. The ethanolic extract of *Tamarindus indica* contained fatty acids as well as various important elements such as arsenic, calcium, cadmium, copper, iron, sodium, manganese, magnesium, potassium, phosphorus, lead, and zinc. In India, Africa, Bangladesh, Pakistan, Nigeria, and the majority of tropical countries, as well as in other areas of the world, *Tamarindus indica* is used as a traditional medicine. In traditional medicine, it has been used to treat abdominal pain, diarrhoea, and dysentery, as well as helminth infections and wound healing. It has also been used to treat malaria and other parasitic infections as well as inflammation, cell cytotoxicity, gonorrhoea, and eye problems. In addition to its anti-diabetic and anti-microbial properties as well as its antivenomic and antioxidant properties, it also possesses antimalarial and hepatoprotective properties as well as laxative and anti-hyperlipidemic properties.⁽²⁷⁾ *Tamarindus indica* also has a key role in the dissolution of kidney stones, as previously stated.⁽²⁸⁾

17) *Tridax procumbens* (Asteraceae): Despite its native origins in the tropical Americas, it has been successfully introduced into tropical, subtropical, and mild temperate areas worldwide. During a phytochemical screening, *Tridax procumbens* was found to contain alkaloids, saponins, flavonoids (catechins and flavones), fumaric acid, carotenoids, and tannins. Among other nutrients, it has a high concentration of carotenoids, saponins, oleic acid, and ions such as sodium, potassium, and calcium. Its blooms are claimed to be rich in antioxidants such as luteolin, glucoluteolin, quercetin, and isoquercetin. All anti-inflammatory and hepatoprotective actions, wound healing, antidiabetic activity, immunomodulatory activity, dysentery and diarrhoea, as well as antibacterial

activity against both gram-positive and gram-negative bacteria, have all been demonstrated in this plant. Due to the antibacterial, insecticidal, and parasiticidal properties of its leaf juice, it is used to cure conjunctivitis. According to mythology, the leaf juice of *Tridax procumbens* has been traditionally recognised as possessing antilithiatic effects.⁽²⁹⁾

19) *Mentha piperita* (Lamiaceae): Currently, the plant is widely disseminated and farmed in a range of climates and locations throughout the world. It is occasionally detected alongside its parent species in the wild, but this is quite rare. Menthone and carboxyl esters, particularly menthyl acetate, are also included in the composition of the essential oil. Peppermint contains a high concentration of bioactive compounds and has been used for centuries to cure lithiasis and other kidney stones. *Mentha piperita* has been shown to have anti-inflammatory and antiviral qualities, as well as larvicidal and biopesticidal capabilities, radioprotective, anticancer and anti-diabetic properties. An in vivo ethylene glycol-induced urolithiasis model, as well as in vitro calcium oxalate crystallisation tests, including nucleation and aggregation assays and oxalate depletion assays, are used to determine the scientific validity of antiurolithiatic efficacy in male albino rats.⁽³⁰⁾

20. *Nigella sativa* (Ranunculaceae): It is a blooming perennial plant native to South and Southwest Asia. On a local level, it is used in traditional medicine to treat and prevent bronchial asthma, coughing, diarrhoea, abdominal pain, and dyslipidemia. Oleic acid, linoleic acid, palmitic acid, and trans-anethole are all found in *Nigella sativa* oil, as well as nigellidine, nigellimine, and nigellimine N-oxide. Aromatic chemicals such as dihydrothymoquinone, thymoquinone, carvacrol, p-cymene, and thujene are also present. Anti-inflammatory, anticancer, anti-diabetic, immunomodulator, analgesic, antibacterial, spasmolytic, bronchodilator, hepatoprotective, renal-protective, gastroprotective, and antioxidant properties have been examined.⁽³¹⁾

II. CONCLUSION:

Medicinal plants have been widely accepted since ancient times for a variety of reasons, including fewer harmful effects, safety, effectiveness, low cost, lower risk of disease recurrence, and easy availability in slum areas. There is no effective treatment for urolithiasis in allopathy, and the medications that are available have side effects. Surgical therapy is also an

option, but it comes with a higher risk of recurrence. As a result, medicinal herbs may be useful in the treatment of kidney stones. The information given in this review, which talks about plants that can help people with urolithiasis, will help researchers find new drugs for this common human ailment. This will help them overcome the many problems that people face today and find relief from the disease.

REFERENCE:

- [1]. Wang Z, Zhang Y, Zhang J, Deng Q, Liang H. Recent advances in kidney stone formation mechanisms have resulted in a new understanding of the mechanisms of kidney stone formation. *International Journal of Molecular Medicine*, August 1st, 2021; 48(2): 1-0.
- [2]. Update on Current Concepts in Kidney Stone Disease *Advances in Urology*, 4 February 2018.
- [3]. Traxer O, Keller EX. Thulium fibre laser: the new player for kidney stone treatment? A comparison with the Holmium YAG laser *The World Journal of Urology*, August 2020;38(8):1883-94.
- [4]. G. M. Pirola, G. Saredi, R. Codas Duarte, L. Bernard, A. Pacchetti, L. Berti, E. Martorana, G. Carcano, L. Badet, and H. Fassi-Fehri (2018). A matched-pair analysis from two institutions *Therapeutic advances in urology*
- [5]. D. Waghmare S. Ethnobotanical Survey on the Antiurolithiatic Activity of Some Medicinal Plants. 2020 Aug 1; 2: 268-75. *International Research Journal on Advanced Science Hub*. 2020 Aug 1; 2: 268-75.
- [6]. Sharma N, Tanwer BS, Vijayvergia R, Study of medicinal plants in the Aravali regions of Rajasthan for treatment of kidney stones and urinary tract troubles. *International Journal of Pharmaceutical Technology Research*. 2011;3(1):110-3.
- [7]. A review of the phytochemical and pharmacological profiles of *Bryophyllum pinnatum* (Lam.) Kurz. *Pharmacognosy Reviews*, 3(6), 364 (July 1, 2009)
- [8]. Yadav M, Gulkari VD, Wanjari MM. *Bryophyllum pinnatum* leaf extracts prevent the formation of renal calculi in lithiatic rats. *Oct 2016;36(2):90*.
- [9]. Varshochi, F., and Adollahi, K. (2015). Alhagi, a traditional and modern medicine that is effective in the treatment of kidney stones. 15–16 in *Journal of Nephro pharmacology*, 6(1).
- [10]. Asha, Sivaji, and Palaniyandi, Thirunavukkarasu (2013). *Amaranthus Viridis Antiurolithiatic Activity in Male Rats Induced by Ethylene Glycol*, 13-17.
- [11]. Asha S, Thirunavukkarasu P. Antiurolithiatic activity of *amaranthusviridis* on ethylene glycol-induced male rats. *Rapid pharmacognosy*, 13(4), 2013.
- [12]. *Journal of Phytological Research*, 15(1):1-6, 2002.
- [13]. Rahimi-Madiseh, M., Lorigoini, Z., Zamani-Gharaghoshi, H., & Rafieian-Kopaei, M. (2017). *Berberis vulgaris*: specifications and traditional uses. 569–587 in the *Iranian journal of basic medical sciences*.
- [14]. Bashir S, Gilani AH, Antiurolithic effect of *Bergenia ligulata* rhizome: an explanation of the underlying mechanisms. *Journal of Ethnopharmacology*, 122(1): 106-16, 2009.
- [15]. Curative treatment with extracts of *Bombax ceiba* fruit reduces the risk of calcium oxalate urolithiasis in rats. *Pharmaceutical biology*, 50 (3), 310-7, 1 March 2012.
- [16]. Oburai, N. L., Rao, V. V., and Bonath, R. B. (2015). Comparative clinical evaluation of *Boerhaviadiffusa* root extract with standard Enalapril treatment in canine chronic renal failure. *Ayurveda and Integrative Medicine*, 6(3), pp. 150–157.
- [17]. (2017). Montealegre, C. M., & De Leon, R. L. (2017). effect of *Blumea balsamifera* extract on the phase and morphology of calcium oxalate crystals. 4(4), 201–207. *Asian Journal of Urology*, 4(4), 201–207.
- [18]. Saleem M, Javed F, Asif M, Baig MK, Arif M. HPLC Analysis and In Vivo Renoprotective Evaluation of *Cucumis melo* Seed Hydroalcoholic Extract in Gentamicin-Induced Renal Damage *Medicina (Kaunas)*, April 15th, 2019; 55(4): 107.
- [19]. Rocha L, Fernandes CP. Aniseed (*Pimpinella anisum*, Apiaceae) Oils 1 January 2016 (pp. 209–213). Academic Press.
- [20]. (2016). Amina, Bekara, & Hamadouche, Ait, Khaloulakhaleh, Nesrine, Sadi, & Abdelkader, Aoues. (2016). 10. Experiment in vivo.
- [21]. Gokhru (*Pedaliu murex* L.) biological activities and medicinal properties *Asian*

- Pacific journal of tropical biomedicine, 2(7), 581-5, July 1, 2012.
- [22]. Ramadevi, s. & Balasubramanian, Kaleeswaran & Soundharrajan, Ilavenil & Upgade, Akilesh & Tamilvendan, D. & Rajakrishnan, R. & Farhan, A.H. & Kim, Y.-O & Kim, Hak-Jae. (2020). For the management of kidney stones, the effect of the traditionally used herb *Pedaliium murex* L. and its active compound pedalin on urease expression is significant. *Saudi Journal of Biological Sciences*, 27.10.
- [23]. Pucci ND, Marchini GS, Mazzucchi E, Reis ST, Srougi M, Evazian D, Nahas WC. The effect of *phyllanthus niruri* on metabolic parameters in patients with kidney stones: a potential disease prevention strategy. *J. Urol is a Brazilian international*. 2018 Jul;44:758-64.
- [24]. Chaudhary, A., Singla, S. K., & Tandon, C. (2010). In vitro Evaluation of *Terminalia arjuna* on Calcium Phosphate and Calcium Oxalate Crystallization 72(3), pp. 340–345. *Indian Journal of Pharmaceutical Sciences*, 72(3), pp. 340–345.
- [25]. Reddy NM, Reddy RN. *Tinospora cordifolia* chemical constituents and medicinal properties: a review. *Acad J Pharm Sci*. 2015 Nov;4(8):364-9.
- [26]. Goyal, Parveen Kumar, & Mittal, Arun, and Kumar, Rishi. (2011). Evaluation Of *Tinospora Cordifolia* For Antiuro lithiatic Potential. *The Journal of Pharmaceutical and Biomedical Sciences*
- [27]. Bhadoriya SS, Ganeshpurkar A, Narwaria J, Rai G, Jain AP. *Tamarindus indica*: scope of investigated potential. *Pharmacognosy reviews* 2011 Jan;5(9):73.
- [28]. Malviya V, Tawar M, Burange P, Jodh R. A Brief Review on Resveratrol. *Asian Journal of Research in Pharmaceutical Sciences*. 2022 May 25;12(2):157-62.
- [29]. S., Kalpana, T. Rai, and R. Niramaladevi. (2014).5. 411-416. of *Tridax procumbens* extract on calcium oxalate crystallisation under in vitro conditions. 5. 411-416.
- [30]. Jodh R, Tawar M, Kachewar A, Mahanur V, Sureka Y, Atole V. Pharmacological Review on *Madhuca longifolia*. *Asian Journal of Research in Pharmaceutical Science*. 2022 Mar 1;12(1).
- [31]. Jodh R, Tawar M, Burange P, Malviya V. A Pharmacological Review on Orchid *Dactylorhiza hatagirea* (D. Doon) Soo.
- Asian Journal of Pharmacy and Technology. 2022 May 25;12(2):141-5.