



## A REVIEW ON ANTI-UROLITHIATIC HERBS IN SIDDHA MEDICINE

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### ABSTRACT

Urolithiasis is the condition where urinary stones are formed or located anywhere in the urinary system. Urolithiasis is the third most common disorder of urinary tract found in humans and its incidence is quite high all over the world. Urinary calculi are formed by deposits of polycrystalline aggregates composed of various amount of crystalloid and organic matrix. It is clinically manifested by dysuria, burning and painful micturition, pain in the pelvis and lumbo sacral region and the presence of small stones in the urine. It is estimated that at least 10% of the population in the industrialized part of the world is afflicted by urinary tract stone disease. In Siddha system of Medicine, there are many herbs which are used to prevent the recurrence of the stone formation. Herbals have been used to help in Urolithiasis through anti-inflammatory, litholytic, antimicrobial and antispasmodic action. This article reviews about the anti urolithiatic activity of the herbs are *Mimusops elengi*, *Musa paradisiaca*, *Crateva magna*, *Asparagus racemosus*, *Tribulus terrestris*, *Moringa oleifera*, *Carica papaya*, *Raphanus sativus*, *Cynodon dactylon*, *Ichnocarpus frutescens*, which are commonly used in siddha medicine.

**KEYWORDS:** Anti urolithiatic activity, Urolithiasis, Medicinal herbs, Siddha Medicine.

### INTRODUCTION

Mankind has been afflicted by urinary stones (Urolithiasis) since centuries, and it is proven to be an important cause of renal failure.<sup>[1]</sup> Calculus formation at any region in the urinary tract kidney to urethra, leads to urolithiasis. It is clinically manifested by dysuria, burning and painful micturition, pain in the pelvis and lumbo sacral region and the presence of small stones in the urine.<sup>[2]</sup> Urinary stones affect 10-12% of the population in industrialized countries.<sup>[3]</sup> Annual incidence is about 1-2 cases of acute renal colic per 1000 people and average lifetime risk around 5-10%. The epidemiology of urolithiasis differs according to geographical area in terms of prevalence incidence, age, sex distribution, stone composition and stone location. Men commonly affected than women to the ratio of 3:1. The peak age for developing stones is between 30 and 50. Recurrence is common.<sup>[4]</sup> The etiology of this disorder is multifactorial and is strongly related to dietary lifestyle habits.<sup>[5]</sup> Increased rates of hypertension and obesity, which are linked to nephrolithiasis, also contribute to an increase in stone formation. About 75% of renal stones are composed of either calcium oxalate or calcium oxalate crystals mixed with calcium phosphate.<sup>[6]</sup> The clinical features of *Kalladaippu* described in the classical Siddha text *Yugi Vaithiya Chinthamani* correlates with that of Urolithiasis.<sup>[7]</sup>

The Siddha system of medicine is considered one of the most ancient traditional medical systems in which many herbs are used in the treatment of urolithiasis. In Modern medication and surgical techniques like extracorporeal shock wave lithotripsy [ESWL] intracorporeal lithotripsy, urethroscopy with lithotripsy, nonsteroidal anti-inflammatory drugs are currently being used for the management of urolithiasis, which cause many adverse effects such as haemorrhage, haematuria, tubular necrosis and subsequent fibrosis of the kidney.<sup>[8]</sup> The herbal medicine is becoming popular due to toxicity and side effects of allopathic medicines.<sup>[9]</sup> Traditional herbal medicine is an important part of the healthcare system in India. Since most of the plants are claimed to be non-toxic, low cost, available in rural areas and their effectiveness in the treatment of urinary stones has been widely studied.<sup>[10]</sup> The uses of traditional medicines are widely spread and plants represent a large source of natural chemicals that might serve as leads for the development of the novel drugs.<sup>[11]</sup> There are many herbs which are used to prevent the recurrence of the stone formation in Siddha System. Herbals have been used to help in Urolithiasis through anti-inflammatory, litholytic, antimicrobial and antispasmodic action possess potent anti urolithiatic activity.

## COMMONLY USED ANTI- UROLITHIATIC HERBS IN SIDDHA MEDICINE

S.No	Botanical Name	Family	Name in Siddha	Part Used	Ref.No
1	<i>Mimusops elengi</i>	Sapotaceae	Magizham	Fruits & Flowers	[12]
2	<i>Musa paradisiaca</i>	Musaceae	Vazhai	Stem Kernel Juice	[13]
3	<i>Crateva magna</i>	Capparaceae	Mavilangam	Leaf, Root	[14]
4	<i>Asparagus racemosus</i>	Lilliaceae	Thanneervittan	Root Tuber	[15]
5	<i>Tribulus terrestris</i>	Zygophyllaceae	Nerunjil	Seeds	[16]
6	<i>Moringa oleifera</i>	Moringaceae	Murungai	Leaves	[17]
7	<i>Carica Papaya</i>	Caricaceae	Pappali	Fruit	[18]
8	<i>Raphanus Sativus</i>	Brassicaceae	Mullangi	Root, Leaves	[19]
9	<i>Cynodon dactylon</i>	Poaceae	Arugambul	Leaves	[20]
10	<i>Ichnocarpus frutescens</i>	Apocynaceae	Pallvalli	Leaves	[21]

SIDDHA MEDICINAL USES<sup>[22]</sup>

S.No	Botanical Name	Uses in Siddha System
1	<i>Mimusops elengi</i>	Sinusitis, asthma, headache, fever, pediatric constipation, loss of Libido
2	<i>Musa paradisiaca</i>	White discharge, dysmenorrhea, increase skin complexion, wheezing
3	<i>Crateva magna</i>	Tridoshas, kidney stones, snake bite, urticaria
4	<i>Asparagus racemosus</i>	Diabetes, pulmonary tuberculosis, diarrhoea, abdominal colic pain, leucorrhoea
5	<i>Tribulus terrestris</i>	Burning micturition, cystitis, fever, jaundice, polydipsia tuberculosis
6	<i>Moringa oleifera</i>	Head ache, vatha diseases, tuberculosis, eye disease, worm infections, abdominal pain, cervical asthma, back pain
7	<i>Carica papaya</i>	Hepatomegaly, splenomegaly, duodenal ulcer, eczema, indigestion.
8	<i>Raphanus sativus</i>	Duodenal ulcer, intestinal worms, eczema, itching in anus, constipation, anorexia, indigestion
9	<i>Cynodon dactylon</i>	Scabies, itching, head ache, hypertension, burning micturition, leucorrhoea
10	<i>Ichnocarpus frutescens</i>	Diabetes, eczema, fever, indigestion, vatha diseases

**1. *Mimusops Elengi***

The anti- urolithiatic activity of *Mimusops elengi* bark were evaluated by using ethylene glycol induced urolithiatic model in wistar albino rats. Petrolium, Ether, Chloroform and Alcohol extracts (ALE) of *Mimusops* bark were evaluated for anti urolithiatic activity rats. All the extracts of *Mimusops elengi* are orally and exhibited no gross behavioural changes in the rats. In hypercalculi animals the calcium, oxalate and phosphate excretion grossly increased. However deposition of stone forming constituents in the kidneys of calculogenic rats were significantly ( $p < 0.001$ ) lowered by curative and preventive treatment with alcohol extract (ALE) if *Mimusops elengi*. The results confirm that alcoholic extracts of *Mimusops elengi* possess potent antiurolithiatic activity.

**2. *Musa paradisiaca***

The study was carried out to evaluate the anti urolithiatic effect of *Musa Paradisiaca* stem kernel juice was investigated in experimental urolithiatic rats. Stone forming rats exhibited a significant elevation in the activities of two oxalate synthesizing enzymes glycolic acid oxidase and lactate dehydrogenase. Deposition and

excretion of stone forming constituents in kidney and urine were also increased in the rats. The enzyme activities and the level of crystalline components were lowered with the extract treatment. The extract also reduces the activities of urinary alkaline phosphate, lactate dehydrogenase, inorganic pyrophosphatase and B- glucuronidase in calculogenic rats. The result confirm that *Musa paradisiaca* possess potent anti urolithiatic activity.

**3. *Crateva magna***

The anti- urolithiatic activity of *Crateva magna* was investigated in experimental albino rats. The ethanol (400mg/kg bw) of *Crateva magna* in rat models result in reduced serum creatinine and calcium, urine volume output. The result shown by ethanol extract (400mg/kg bw) group was compared to standard polyherbal drug treated group and thus exhibited potent anti urolithiatic activity.

**4. *Asparagus racemosus***

The ethanolic extrat of *Asparagus racemosus* at doses 200, 400, 800 and 1600mg/kg for anti urolithiatic activity in rats the extract showed significantly ( $p < 0.05$ )

reduce serum concentrations of calcium, phosphorus, urea and creatinine. This confirms that ethanolic extract showed anti urolithiatic activity.

##### 5. *Tribulus terrestris*

Ethanolic extract of the fruit of *Tribulus terrestris* showed significant dose dependent protection against urolithiasis of rats bread implantation. The effect of aqueous extract of *Tribulus terrestris* reduce oxalates in rats were oxalate induced by sodium glycolate synthesizing liver enzyme like glycolate oxalate, glycolate dehydrogenase and lactate dehydrogenase and decreased LDH activity. It was confirmed that the ethanolic extract of *Tribulus terrestris* possesses potent anti urolithiatic activity.

##### 6. *Moringa Oleifera*

In the present study aqueous extract of bark *Moringa oleifera* administered orally, was evaluated for its anti urolithiatic potential in albino rats of wistar strains. The stone were produced in this study by zinc disc foreign body insertion in the bladder supplemented with 1% ethylene glycol in drinking water. The reduction in weight of the stone was used as criteria for assessing the preventive or curative groups were used in both groups. The oral administration of the extract of bark of *Moringa oleifera* has resulted in significant reduction in the weight of bladder stones compared to control group. It was confirmed that aqueous extract of *Moringa oleifera* possesses potent anti urolithiatic activity.

##### 7. *Carica papaya*

The Present study was undertaken to evaluate the anti urolithiatic effect of aqueous and alcoholic extracts of the fruit of *Carica papaya* on ethylene glycol induced urolithiatic rats were treatment with aqueous and alcoholic extracts *Carica Papaya* fruit significant reduced the elevated urinary oxalate, showing regulatory action on endogenous oxalate synthesis. The Increased deposition of stone forming constituents in the kidneys of calculogenic rats was also significantly lowered the result indicate that the fruit of *Carica papaya* endured with anti urolithiatic activity and scientifically valid in the treatment of urinary calculi.

##### 8. *Raphanus sativus*

The aqueous extract of the bark of *Raphanus Sativus* was tested for its anti urolithiatic and diuretic activity. The urolithiasis was experimentally induced by implantation of zinc disc in the urinary bladder of rats significant decreases in the weight of stones was observed after treatment in animals which received aqueous extract of *Raphanus sativus*. This extract showed an increase in the 24 hrs urine volume to the control. It was finalized that the aqueous solution of *Raphanus Sativus* produces significant anti urolithiatic activity.

##### 9. *Cynodon dactylon*

Hydroalcoholic extract of *Cynodon dactylon* was evaluated for its anti urolithiatic activity in rats.

Ethanolic extracts of *Cynodon dactylon* at doses equivalent to 3.2mg/kg and 12.6mg/kg of root powder. However *Cynodon dactylon* was able to decrease the weight of kidney urine oxalate level decreased in nephrolithiatic rats treated with the extract this study showed that *Cynodon dactylon* extract was able to reduce the growth of urinary stones in the rat. Therefore the beneficial action of *Cynodon dactylon* extract on human kidney stones may be suggested.

##### 10. *Ichnocarpus frutescens*

The inhibitory effects of the roots of *Ichnocarpus frutescens* on nephrolithiasis induced in rats by feeding with ethylene glycol water (0.75%). Ethylene glycol resulted in hyperoxaluria as well as increased renal excretion of calcium and phosphate. Supplementation with ethyl acetate extract of *Ichnocarpus frutescens* significantly reduced the elevated urinary oxalate showing a regulatory action on endogenous oxalate synthesis. The result indicates that the root of *Ichnocarpus frutescens* is endured with anti urolithiatic activity

#### CONCLUSION

Siddha system of medicine has rich collection of herbs for the treatment of various acute and chronic ailments. The herbs in Siddha system proved to have anti urolithiatic activity. These herbs are largely used by Siddha practitioners and society of southern regions of India. From this review, it is proved that there are several Siddha herbs which wield anti urolithiatic activity at particular dose. It can be concluded that many herbs have potent anti urolithiatic activity with better results.

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