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CRITICAL REVIEW OF ASMARIHARA DRAVYA IN BHAVAPRAKASH NIGHANTU WITH REFERENCE TO UROLITHIASIS

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ABSTRACT

Asmari (Urolithiasis) is a very common worldwide problem, troubling mankind since ages and is one of the major reasons of abdominal pain in these days. The therapies available in different systems of medicine are not able to prevent its pathogenesis, even the surgical methods available for the management of calculi like extracorporeal shock wave lithotripsy, cystolithotomy etc, also fail to prevent the recurrences and have even got many side effects such as sepsis, strictures, So, the recurrences even after removal of the calculi is becoming a great problem and efforts are being made constantly to find out an effective treatment of urolithiasis as well as prevention of its recurrence. Hence, alternative treatment modalities have gained importance. A number of Ayurvedic single medicinal herbs or formulations have been used since past for managing disorders including urinary stones. They have been claimed to have litholytic and litho preventive properties. The main aim of this review paper is to collect the information of mutrasmarihara drug mentioned in Bhavaprakasha nighantu and their critical analysis and validation with recent researches.

KEYWORDS: *Ayurveda, Bhavaprakash Nighantu, Mutrasmarihara, Asmari, Antiurolithiasis, recent research update.*

INTRODUCTION

Mutrasmari (Urolithiasis) is a multifactorial process. A kidney stone is a hard, crystalline mineral material formed within the kidney or urinary tract. Kidney stones are a common cause of blood in the urine and often severe pain in the abdomen, flank, or groin. Kidney stones are also called renal calculi.[1] The condition of having stones in kidney is termed as nephrolithiasis and stones at any location in the urinary tract is referred as urolithiasis. Renal stone formation requires that stone forming crystalloids in urine come out of solution. Because crystalloids in solution are in equilibrium with crystalloids in the solid phase, a minimum condition is that urine be supersaturated with relevant crystalloids. This condition is often met: many healthy persons, probably the majority, have concentrations of calcium and oxalate in urine such that their activity product exceeds the solubility threshold (i.e. urine is supersaturated with these crystalloids). But urine has a strong inhibitory action that prevents crystallization and other stone forming processes. Hence, although urine is supersaturated, crystalloids remain in solution.[2] Three processes promote stone formation: nucleation, aggregation and crystal growth. Medical therapy can reduce the risk of recurrence of stone in 80 to 90% of patients but may not successfully remove existing stones. So surgery should be reserved for stones, which are larger, damages kidney tissue, because severe urinary tract infections, back flow of urine etc. The options available for treatment are extracorporeal shockwave lithotripsy (ESWL),[3] Percutaneous ephrolithotomy (PCNL), ureteroscopic stone removal.[4]

Mutrasmari (Urolithiaasis) is the 3rd most common disorder of the urinary tract. Cases of urinary calculi are present worldwide but are particularly common in some geographic location such as in parts of United States, South Africa, India and South East Asia. It is estimated that approximately 2% of the world population experiences renal stone disease at sometime in the lifespan with a male-female ratio of 2:1. The peak incidence is observed in 2ndto 3rd decade of life. Renal calculi are characterized clinically by colicky pain (renal colic) as they pass down along the ureter and manifest by hematuria. Major risk factors responsible for the nephrolithiasis are inadequate urinary drainage, microbial infections, diet with excess oxalates and calcium, vitamin abnormalities i.e; deficiency of Vitamin-A, excess of vitamin D, metabolic diseases like hyperparathyroidism, cystinuria, gout, intestinal

dysfunction[5] and environmental factors related to regions with hot and dry climatic conditions.[6]

Mutrasmarihara Dravya (Antiurolithiatic drugs) in Bhavaprakash Nighantu

Among 426 drugs dealt in Bhavaprakasha Nighantu 37drugs are mentioned as Mutrashmarihara (Antiurolithiatic). Most of these drugs contain several phytochemicals, which possess strong antioxidant and diuretic and urolithiatic activities. The antioxidant phytochemicals which are proved as Antiurolithiatic agents are flavonoids, terpenoids, polyphenols (Ellagicacid, Gallic acid, Tannins), alkaloids, saponins, vitamins, carotenoids, minerals (Iron sulfate, Potassium nitrate, soda bicarbonet, Asphaltum). Several in vivo and in vitro studies have demonstrated that hyperoxaluria, a major risk factor for calcium oxalate nephrolithiasis, results in greater production of superoxide and hydroxyl free radicals, leading antioxidant imbalance, cell membrane rupture and cell death which leads to Calcium Oxalate crystal adherence and retention in renal tubules Thus, it can be speculated that the inhibitory effect of the plant extract on Calcium Oxalate crystal deposition in renal tubules is possibly caused by its antioxidant activity.[7]

Pharmacological screening for Antiurolithiatic activity is mostly done on experimental model like Ethylene glycol induced urolithiasis.

Table 1: Plants detail for Mutrashmarihara (Antiurolithiatic) Drugs in Bhavaprakasha Nighantu.

S. No	Sanskrit name	Latine name	Family	Rasa	Guna	Virya	Vipaka	Karma	Chemical constituents
1	Haritaki	Terminalia chebula	Combretaceae	Kasaya pradhan pancharasa	Laghu, Rukshya	Usna	Madhura	Tridosasamaka	Tannin, Gallic acid
2	Amalaki	Emblica officinalis	Euphorbiaceae	Amla pradhana pancharasa	Laghu, rukshya sita	Sita	Madhura	Tridosahara, pittasamaka	Ascorbic acid, tannic acid, gallic acid
3	Ajamoda	Carum roxburghianum	Apiaceae	Katu, tikta	Lahu, rukshya, tikshna	usna	Katu	Kaphavatasamaka	Thymol, volatile oil
4	Parasik yavani	Hyescyamus niger	Solanaceae	Tikta, katu	Rukshya	usna	Katu	Kaphavatasamaka	Hyoscine, atropine, scopoline
5	Jeeraka	Cuminum cyminum	Apiaceae	Katu	Laghu, rukshya	usna	Katu	Kaphavatasamaka	Cuminol,
6	Kustha	Saussurea lappa	Asteraceae	Tikta, katu, madhura	Laghu, rukshya	usna	Katu	Kaphavatasamaka	Resinoids., essential oil
7	Pashanabheda	Bergenia ligulata	Sexifragaceaea	Tikta, Kaasaya	Laghu, snigdha	Sita	Katu	Tridosasamaka	Tannic acid, Gallic acid
8	Manjistha	Rubia cordifolia	Rubiaceae	Tikta, Kasaya, madhura	Guru, Rukshya	usna	Katu	Kaphapittasamaka	Anthraquenone, saponine
9	Suvarchika	Potassium nitrate	-	Katu	Tikshna	usna	Katu	Kaphavatasamaka	
10	Sugaha	Soda bicarbonate		Katu	Rukshya	Sita	Katu	Kaphapittasamaka	
11	Devdaru	Cedrus deodara	Pinaceae	Tikta, katu	Laghu, snigdha	usna	Katu	Kaphavatasamaka	Oleo-resin
12	Dhupasarala	Pinus longifolia	Pinaceae	Katu, tikta, kasaya	Laghu, snigdha, tikshna	usna	Katu	Kaphavatasamaka	Turpentine, essential oil
13	Guggulu	Commiphora mukulu	Burcireceae	Tikta, Katu, Kashaya	Laghu, Rukshya, Visada, Sukshma, Sara	usna	Katu	Kaphasamaka	Oleorexin, myrecene
14	Sthulaila	Amomum subulatum	Zingiberaceae	Katu, tikta	Laghu, rukshya	usna	Katu	Tridosasamaka	Aromatic oil, cineole,
15	Golochana	Bezoar (serpent stone)		Tikta	Sita	Sita	Madhura		Diterpinoids, tridecyl myristate
16	Saileyam	Parmelia perlata	Parmeliaceae	Tikta	Sita	Sita	Katu		Lichenine, Crysephenic acid
17	Granthi trin	Poligonam aviculare	Poligonaceae						Poligonic acid
18	Kantakari	Solanum Xanthocarpum	Solanaceae	Tikta, katu	Guru, Laghu, Rukshya	usna	Katu	Kaphavatasamaka	Solasonine, caumarins scopolin
19	Gokshura(La	Tribulus	Zygophyllace	Madhura	Guru, snigdha	Sita	Madhura	Vatahara	Disogenine,

	ghu)	terrestris							quercetine
20	Gokshura(vrihat)	Pedalium murex	Pedaliaceae	Madhura	Guru, snigdha	Sita	Madhura	Triddosasamaka	Flavonoids, neotigogenine
21	Thuhara	Euphorbia nerifolia	Euphorbiaceae	Katu	Laghu, Tikshna	usna	Katu	Vatakaphasamaka	Nerifolial
22	Dhatura	Datura metal	Solanaceae	Tikta, Kashaya, Madhura	Guru, Rukshya, Tikshna	usna	Katu	Vatakaha samaka	Tropine, scopolamine, hyoscine
23	Shigru	Moringa pterygosperma	Moringaceae	Katu	Ruksya, Tikshna, Sara, Laghu	Usna	Katu	Vatakaphasamaka	Amino acid, organic acid ie oxalic acid, malic acid
24	Kasa	Saccharum spontaneum	Poaceae	Madhura, Tikta	Laghu, Snigdha	Sita	Madhura	Vatapitta samaka	Alkaloids, Flavonoids, Tannin and Saponine
25	Yaraka	Typha elephantine	Typhaceae	Madhura, Tikta	Laghu, Snigdha	Sita	Madhura	Vatapitta samaka	Amino acid glucose
26	Kusha	Desmostachya bipinnata	Gramineae	Madhura, Kashaya	Laghu, Snigdha	Sita	Madhura	Tridosahara	Triterpinoids, Isoarborinol
27	Darva	Imperata cylindrical	Poaceae	Madhura, Kashaya	Laghu, Snigdha	Sita	Madhura	Tridosa samak	Cylindrin, isoarborinol
28	Patha	Cissampelos paeira	Menispermaceae	Tikta	Laghu, Tikshna	Usna	Katu	Vatakapha samaka	Alkaloids ie. quercitol, haytidinine
29	Varuna	Crataeva nurvala	Capparidaceae	Kashaya, Tikta, Madhura	Laghu, Rukshya	Usna	Katu	Kaphavata samaka	Lauric aid, Stearic Acid, Friadeline
30	Vijapura	Citrus medica	Rutaceae	Amla	Tikshna	Usna	Amla	Vatakapha samakaa	Campesterol, Stigmasterol
31	Shilajatu	Asphaltum		Katu, Tikta	Laghu, Snigdha	Sita	Katu	Kaphavata samaka	Fe, cu, Au, Ag,
32	Kasisa	Iron Sulphate		Amla, tikta,Kashaya	Laghu, Tikshna	Usna	Katu	Vatakapha samaka	
33	Kulattha	Dolichos biflorus	Fabaceae	Kasaya	Laghu, Rushya, Tikshna	Usna	Katu	Vatakapha samaka	Strepogenine, *β sitesterol*
34	Tila	Sesamum indicum	Pedaliaceae	Madhura, Kashaya, Tikta, Katu	Guru, Snigdha	Usna	Katu	Vata samaka	Sesamolinol, sesamol
35	Gindisha	Citrullus vulgaris	Cucurbitaceae	Madhura, Kashaya	Guru, Snigdha	Sita	Madhura	Vatapitta samaka	Protein, fat, minerals
36	Mulaka	Raphanus sativus	Cruciferae	Katu	Tikshna, Laghu	Usna	Katu	Tridosahara	Sulphoraphene, Castasterone
37	Athavika Ghrita	Ghee of sheep		Madhura	Laghu	Usna	Madhura	Vata Samaka	

Table 2: Number of Mutrasmarihara Drugs in Bhavaprakash Nighantu according to Varga.

S. No	Name of Varga	Number of Drugs
1	Haritakyadi	10
2	Karpuradi	7
3	Guduchyadi	11
4	Vatadi	1
5	Amrdi	1
6	Dhatwadi	2
7	Dhanyadi	2
8	Saka	4
9	Ghrita	1

Table 3: Number of Mutrasmarihara Drugs in Bhavaprakash Nighantu according to rasa.

S. No	Rasa	Number of Drugs
1	Madhura	3
2	Tikta	3
3	Kasaya	1
4	Katu	7
5	Tikta, Kasaya	1
6	Tikta, katu, Madhura	1
7	Tikta, Kasaya, Madhura	3
8	Katu, tikta	6
9	Tikta, katu, kasaya	2
10	Madhura, Tikta	2
11	Madhura, Kasaya	3
12	Amla,	1
13	Amla, Tikta, Kasaya	1
14	Madhur, Tikta, Katu, Kasaya	1
15	Pancharasa	2

Table 4: Number of Mutrasmarihara Drugs in Bhavaprakash Nighantu according to Guna.

S. No	Guna	Number of Drugs
1	Laghu, Rukshya	6
2	Laghu, Rukshya, Tikshna	3
3	Laghu, Rukshya, Sita	1
4	Rukshya	2
5	Laghu, Snigdha	6
6	Tikshna	1
7	Guru, Rukshya	1
8	Laghu, Snigdha, Tikshna	1
9	Laghu, Rukshya, Visada, Susma, sara	1
10	Laghu, Tikshna	3
11	Tikshna, sara, Laghu, Rukshya	1
12	Guru,snigdha	4
13	Sita	2
14	Guru, Rukshya, Tikshna	1
15	Laghu, Tikshna	2
16	Laghu	1

Table 5: Number of Mutrasmarihara Drugs in Bhavaprakash Nighantu according to Virya.

S. No	Virya	Number of drugs
1	Sita	13
2	Usna	23

Table 6: Number of Mutrasmarihara Drugs in Bhavaprakash Nighantu according to Vipaka.

S. No	Vipaka	Number of Drugs
1	Madhura	12
2	Amla	1
3	Katu	23

Table 7: Number of Mutrasmarihara Drugs in Bhavaprakash Nighantu according to dosakarma.

S. No	Dosakarma	Number of Drugs
1	Tridoshahara/ Tridoshashamaka	8
2	Vatapittashamak/Pittavatasamaka	3
3	Vatakaphashamaka/Kaphavatashamaka	17
4	Kaphapittashamaka/ Pittashleshmahara	2
5	Vatashamaka	3
6	Pittashamaka	1
7	Kaphashamaka	-

According to the Panchabhoutic constituents of Mutrasmarihara Dravya mention in Bhavaprakash Nighantu ,these drugs may useful in following different type of Mutrasmari.

Table 8: Type of Mutrasmari and their useful drugs mention in Bhavaprakash Nighantu.

S. No	Type of Mutrasmari	Name of Drugs
1	Vataja	Haritaki, Pashanbheda, Suvarchika, Devadaru, Dhupasarala, Vrihat Ela, Kantakari, Gokshura, Thuhara, Dhattura, Vijapura, Shigru, Kasa, Yaraka, Kusa, Darbha, Mulaka, Varuna, Shilajatu, Kasisa, Kulattha, Tilakshara, Gindisa, Mulaka.(24)
2	Pittaja	Haritaki, Pashanbheda, Dhupasarala, Vrihat Ela, Kasa, Yaraka, Kusa, Darbha, Mulaka, Gindisa, Mulaka, Manjistha, Sugaha, Shaileyam, Granthitrina.(15)
3	Kaphaja	Haritaki, Parasika yavani, Jeerak, Kustha, Pashanbheda, Manjistha, Suvarchika, Sugaha, Devdaru, Dhupasarala, Guggulu, Vrihat Ela, Kantakari, Thuhara, Dhatura, Shigru, Kusa, Darbha, Varun Bijpura, Shilajatu, Kasis, Kulattha, Mulaka.(24)
4	Sukraja	Haritaki, Kantakari, Kusa, Kasa, Darva, Yaraka, Mulaka.(7)

DISCUSSION

Haritaki (Terminalia chebula Retz.):
Haritaki (Terminalia chebulaRetz.) is the commonest drugs used in Ayurveda practices. It is a one of the content of papular formulation Triphala Churna. Acharya hasmentioned 7types of Haritaki for different purposes. It has Lavana varjit Kashaya Pradhana Pancha rasa and Tridoshahara action as Prabhava (potency).[8] Tannin, Chebulic acid, Chebulinic acid, Gallic acids, Chebulagic acid, Anthrocine glycoside etc.are the major phytoconstituents.[9]

A study Antiurolithiatic Effects of Terminalia chebula Fruit Extract against Ethylene glycol induced renal stone in Wister albino Rat has shown that renoprotectve activity against nidu formation by preventing ROS(reactive oxygen species) generation and COX-2(cyclo-oxygenase-2), Increased the urine volume, has shown balance state of serum urea, creatinine, calcium and uric acid.[10]

Amalaki (Emblica officinalis Gaertn.):
E. officinalis commonly called as Amla (Indian gooseberry) is one of the most studied plant. *E. officinalis* has shown antibacterial, antioxidant, antidiabetic, hypolipidemic, anticancer, hepatoprotective, gastroprotective, antiulcerogenic, nephroprotective and chemopreventive properties.[1,2] Most useful part of plant is fruit and has been explored more for its medicinal values. However, the leaves are explored substantially less. The active constituents of leaves include Apigenin-7-*O*-(6_-butyryl- _-glucopyranoside), flavanone glycosides, gallic acid, methyl gallate, luteolin-4_-O-neohesperidoside, 1,2,3,4,6-penta-*O*-galloylglucose, trihydroxysitosterol, 5 _, 6 _, 7 _-acetoxysitosterol, 5-hydroxymethylfurfural, 2-acetyl-5-methyl furan, pyrogallol, ellagic acid.[12,13,14,15] The active constituents of leaves of *E. officinalis* show antibacterial and antioxidant properties.[7] anti-inflammatory properties.[17,18]

Based on the pharmacological and ethno botanical reports of *E. officinalis*, it Showed as antioxidant properties of plant and protective role of its hydro-ethanolic leaf extract in cisplatin induced nephrotoxicity and shown prevention of deposition ofUrinary oxalate and crystal.[19]

Ajamoda (Apium graveolens):
Ajamoda (Apium graveolens) is a common spice of Indian kitchen. It has shown the presence of Phytoconstituents like alkaloids, flavonoids, tannins, saponins and Cardiac glycosides. Flavanoids and alkaloids are widely distributed in the plant which has the property to cure urolithiasis. The ehanolic extract of Ajamoda that inhibit CaOx crystal aggregations and thus preventing a critical step in urinary stone formation, as larger particles are less likely to pass spontaneously in urinary tract. If the extract keeps CaOx particles dispersed in solution they can be easily eliminated.[20]

Jeeraka (*Cuminum cyminum* L.):
Jeeraka (*Cuminum cyminum* L.) is an aromatic herb of the Apicaceae family, and its fruits are used as a Ingredient of Ayurvedic medicine. In India it is commonly known as cumin or zeera, It contains an essential oil (3-4%) rich in cuminaldehyde (35-60%), α- and β-pinene, γ-3-carene, 1,8 cineole, α-and β-phellandrene, p-cymene, limonene, α-and γ-terpinene, α –terpineol, terpinene-4-ol cuminyl alcohol, trans-dihydrocarvone (menthane type monoterpenoids), myrcene, linalol (acyclic monoterpenoids), β-caryophyllene, β-farnesene, β-elemene (sesquiterpenoids), However, only two flavonoid glycosides 7-O-β-D-glucopyranosides of apigenin and luteolin have been reported as constituents of the water soluble portion of this fruit. Methanolic extract of c. cyminum Linn, significantly reduced the elevated levels of calcium, phosphorous, blood urea nitrogen, uric acid & serum creatinine in curative & preventive treatment groups. The histopathological findings also showed sign of improvement after treatment with the methanolic extract of c. cyminum.[21]

Pashanbheda (Bergenia ligulata Wall.):
Pashanbheda (Bergenia ligulata) Perennial herb with short, thick, fleshy and procumbent stems, Rootstock very stout, Rhizome, solid, barrel shaped, cylindrical. It contains major phenolic compound bergenin, Tannic acid, Flavonoids, Benzenoids, gallic acid, Lactone and glucose. The rhizomes of the herb have been reported to possess Antiurolithiatic, Antibacterial, Antioxident and Anti-inflammatory activity. Study shown that it inhibited calcium oxalate (CaC2O4) crystal aggregation as well as crystal formation in the metastable solutions and exhibited antioxidant effect against 1,1-diphenyl-2-picrylhydrazyl free radical and lipid peroxidation in the in vitro. BLR caused diuresis in rats accompanied by a saluretic effect.[22]

Manjistha (Rubia cordifolia Linn):
The Manjistha (Rubia cordifolia linn.) is a perennial climber often known as common madder. As per the indigenous system of medicine, the roots of Rubia cordifolia Linn. are reported to be useful in the treatment of a wide range of aliments including urinary stones. The Hydro-alcoholic extract (HARC) of Manjistha (Rubia cordifolia) can protect against ethylene glycol induced urolithiasis as it reduce and prevent the growth of urinary stones. Therefore, HARC is helpful to prevent the recurrence of the disease as it showed its effect on early stages of stone development. The mechanism underlying this effect is mediated possibly through an antioxidant, nephroprotection and its effect on the urinary concentration of stone-forming constituents and risk factors.[23]

Devdaru (Cedrus deodara Roxb. Loud):
A tree up to 50 m high and up to 3 m in diameter. Crown conical when young, with drooping leader and branches drooping at the end. IT found at 1100-3000 m, altitude"usually on silicate mother rocks. The best trees are found on deep, well-drained soils. High atmospheric moisture is favourable The principle constituents of the oil are sesquiterpene i.e., α-himachalene (12.5%) and β-himachalene (43%) associated with them are sesquiterpene alcohols (himachalol, allohimachalol, himadarol, isocentdarol and centdarol.Through spectroscopic analysis. some compounds were isolated from the pine needles of cedrus deodara are identified as 9-hydroxy-dodecanoic acid, ethyl laurate , ethyl stearate, 3-beta-hydroxy-oleanolic acid methyl ester, beta-sitosterol, shikimic acid, methyl coniferin, ferulic acid, beta-glucoside. Petroleum ether extract (PECD) of the heart wood of C. deodara is tested for its diuretic and anti-urolithiatic activity. It reduces the elevated serum biochemical levels due to the elimination of these in urine. Histology study shows that PECD treatement had protected against sodium oxalate induced nephrolithiasis. So it is concluded that the plant has great potential to inhibit stone formation.[24]

Bijaura (Cirtrus medica Linn):
Cirtrus medica Linn.(family-Rutaceae), commonly known as Bijoru. This plant is of ancient origin. The more accredited provenance is from India but it probably arrived in Italy through the Hebrews who introduced the cultivation of the Diamante citron on the Calabrian coasts.The unripe fruits of Citrus medica are big, with a thin, smooth, and lemon-yellow peel and the pulp does not yield much juice. Bijoru has been claimed in traditional literature to be valuable against kidney stone. The peel of Citrus fruits has been used in traditional Asian medicine for centuries for Anti-inflammatory, Anti-oxidant, Anti-biotic, cures polyuria, heals urinary calculi, and as antidote. No studies have so far been conducted on biological activity of chemical composition of flowers, leaves and fruits. The diuretic and antioxidant potential of Citrus medica has also been reported by Federica et al. 2011. Citrus medica fruits are also known to contain flavanoids, phenols, citric acid, essential oil, Limonene and y-terpinene. Among all of these constituents, flavanoids are reported for antiurolithiatic action.[25]

Brihata Ela (Amomum subulatum Roxb.):
Amomum subulatum Roxb. (Large Cardamom) is a perennial herbaceous crop, cultivated in swampy places

across hills around water streams. It has been a well known spice since time immemorial; used as flavouring agent to various dishes indigenous to the Eastern Himalayan region particularly Nepal, Bhutan, and India. Sikkim State of India is the largest producer of cardamom that is around 50% of the world's production. Large cardamom contains 8.6% moisture, 5% total ash value, 1.5% ash insoluble in acid, 3.5% water soluble ash value, 4.88% alcohol extract, 4% non-volatile ether extract and 91.4% of total solid. It contains 1.95 to 3.32% of essential oil having characteristic aroma and possesses medicinal properties. It is reported as an official drug in Ayurvedic Pharmacopoeia due to its curative as well as preventive properties for various ailments. The major constituent of large cardamom essential oil is 1,8-cineole. The monoterpene hydrocarbon content is in the range of 5 to 17% of which lamonene, sabeinene, and pinenes are significant components. The terpinols comprise approximately 5 to 7% of the oil. Due to the presence of these compounds, it has pharmacognostic properties such as analgesic, antimicrobial, cardiac stimulant, carminative, diuretic, stomachic etc. It prevents the selective reabsorption of the glomerular filtrate and dilute the urinary crystal.[26]

Kusha ((Desmostachya bipinnata L.):
Kusha (Desmostachya bipinnata(L)) the significant member of family Poaceae is commonly known as sacrificial grass. The reason for it's sacrificial recognition is it's use in Yagnas and religious rites. It is a tufted perennial grass with thick scaly rootstocks, which sends out creeping rhizomes in all directions. Leaves of the grass are many; reach up to 50 cm long and 1 cm broad at the base. Aqueous extractives of Desmostachya bipinnata (L) administered to urolithiasis induced test group rats at a dose of 400 mg/kg for 10 days depicted significant decrease in the quantity of calcium oxalate deposition in the kidneys. It also reversed all the biochemical changes induced by calcium oxalate urolithiasis.[27]

Darva (Imperata cylindrical L.):
Darva (Imperata cylindrica(L)) a species of grass in the family Poaceae. It is a perrenial, rhizomatous grass. It is somewhat variable in appearance. The species puts out extensive rhizomes. And the rhizomegive rise to 3-10' long spreading stems and the leaf blade bunches that grow out of the stems. Imperata cylindrica (L) is ingredients in preparation of Trunpanchmool. The "Trunpanchmool" is used in urinary calculi, retention of urine, diabetes, cardiac disorders, gout, common cough and cold, anemia. No scientific research have been conducted as antiurolithiatic yet.[28]

Kasa (Saccharum spontaneum L.):
Saccharum spontaneum L. known as Kasa (Family: Poaceae) is a traditional herb, it has excellence medicinal value; has been advocated in the treatment gynaecological troubles, respiratory disease. Roots are used as galactagogue and diuretic and in ayurveda system roots are also used as astringent, emollient, refrigerant, diuretic, purgative, tonic, and aphrodisiac and useful in treatment of dyspepsia, burning sensation, piles and sexual weakness.

The stems (culm) are useful in vitiated conditions of pitta and vata burning sensation strongly, renal and vesicol calculi dyspepsia, haemorrhoids, menorrhagia dysentery, agalactia phthisis and general debility he results of the present study have shown that the Glycolic acid induced urinary stones could be dissolved with ethanolic extract of S.spontaneum. The recurrence of stones could also be prevented to a greater extent. The antiurolithiatic activity of this plant can be attributed to its ability to reduce the super saturation of urine with calculogenic ions, diuretic property and anti oxidant potential.[29]

Gokshura (*Tribulus Terrestris Linnn.*):
Gokshura (*Tribulus terrestris* Linn) is an annual herb Belonging to Zygophyllaceae family. It has been used widely in the Ayurvedic System Of Medicine for the treatment Of various urinary disorders including urolithiasis. in order to evaluate the therapeutic claims made for this plant in traditional medicine, the ethanol extract Of *T. terrestris* (fruit) was tested for activity against artificially induced urolithiasis in Albino rats. The extract was administered at daily oral doses Of 25, 50 and 100 Mg/Kg for 4 months. It exhibited dose-dependent antiurolithiatic activity and almost completely inhibited stone formation. Other biochemical parameters in urine and serum, and the histopathology of urinary bladder, which were altered during the process of stone formation, were also normalized by the Plant extract in a dose-dependent manner. These observations thus substantiate the traditional Claim.[30]

Granthi Trina (Polygonum Aviculare L.):
Granti trina (Polygonum avicularae L.) ia an annual prostrate found in field and wasteland with white flower from June to October. The aqueous extract of GranthiTrina (Polygonum Aviculare L.) at doses of 100 and 400 mg/kg significantly reduced accumulation of calcium oxalate crystals and kidney tissue damage in the two prevention and therapeutic groups. There were no significant differences between the different doses and prevention and therapeutic groups. Therefore, it seems aqueous extract of Polygonum Aviculare L. is effective in prevention and treatment of kidney stones in rat models because it contains compounds such as saponins and phenolic and flavonoid substances, and has fat-reducing, anti-oxidant, antibacterial and diuretic effects, although more research is needed to determine the mechanisms related to these effects.[31]

Kantakari (*Solanum xanthocarpum Schrad and Wendl.*):
Kantakari (Solanum xanthocarpum Schrad and Wendl.) belonging to family Solanaceae is one among the Dasamoola of Indian system of medicine. It has been used for treatment of many infectious and degenerative diseases. Present study reported the medicinal efficacy

of *S. xanthocarpum* fruit as antioxidant and a potent antiurolithiatic. Solasodine and solasonine are the main alkaloid of Solanum xanthocarpum. The isolated solasonine have a greater antiurolithiatic and natriuretic activity compared to solasodine.[32]

Saileyam (Parmelia perlata Ach):
The Parmelia perlata Ach is a Lichen plant which is arises from symbiosis of algae and Cynobacterium. The extract exhibited significant antiurolithiatic potentials against Calcium Oxalate calculi in experimental rats. It significantly restored the normal renal architecture and improved the renal functions by restoring the Ethylene glycol + Ammonium chloride) mediated biochemical changes in urine, serum and kidney tissue homogenate parameters of experimental rats towards normal.[33]

Kulattha (Dolicus biflorus Linn.):
Kulattha (Dolicus biflorus Linn.) is a popular pulse grown in many part of India belonging to fabaceae family. The seed extract of D. biflorus had significant antinephrolithiatic activity against Ethylene glycol - induced nephrolithiasis. Administration of seed extract of D. biflorus prevent the Ca_2Co_4 crystal deposition as well as effectively reduced the lipid peroxidation and restores the antioxidant enzyme activity. Thus, phytoconstituents of D. biflorus effectively combat with oxidative stress imposed by hyperoxaluria, which possibly mediated through antioxidant activity of the plant.[34]

Mulaka (Raphanus sativus Linn):
Raphanus sativus is a the flowering plant Belonging to Brassicaceae family. The aqueous extract of the bark of Raphanus sativus is found for its antiurolithiatic and diuretic activity. The urolithiasis was experimentally induced by implantation of zinc disc in the urinary bladder of rats. Significant decrease in the weight of stones was observed after treatment in animals which received aqueous extract in comparison with control groups. This extract showed an increase in the 24 h urine volume as compared to the control.[35]

Shigru (*Moringa pterygosperma Gaertn.*):
Moringa oleifera is the most widely cultivated species in the genus *Moringa*, the only genus in the plant family Moringaceae. Common names include moringa, drumstick tree (from the long, slender, triangular seed-pods. The effect of oral administration of aqueous and alcoholic extract of *M. oleifera* root-wood on calcium oxalate urolithiasis has been studied in male Wistar albino rats. Ethylene glycol feeding resulted in hyperoxaluria as well as increased renal excretion of calcium and phosphate. Supplementation with aqueous and alcoholic extract of *M. oleifera* root-wood significantly reduced the elevated urinary oxalate, showing a regulatory action on endogenous oxalate synthesis. The increased deposition of stone forming constituents in the kidneys of calculogenic rats was also significantly lowered by curative and preventive treatment using aqueous and alcoholic extracts. Thus the results indicate that the root-wood of *M. oleifera* is endowed with antiurolithiatic activity.[36]

Varuna (Crataeva nurvala Buch.-Hum):
Varuuna is a deciduous moderate sized tree. It is recommened by the Ayurveda in the treatment of various urinary problems including renal stone.The alcoholic extract of the stem bark of the Crataeva nurvala showed a significant dose dependent (25-100 mg/kg p.o) prophylactic activity against experimentally induced urolith formation in rats. It also reversed the biochemical parameters in urine, blood and serum and brought back histopathological changes towards normal. Lupeol is the major constituent present in Crataeva nurvala. Antiurolithiatic activity of lupeol was assessed in rats by observing the weight of the stone, biochemical analysis of serum and urine, and histopathology of bladder and kidney. Lupeol not only prevented the formation of vesical calculi but also reduced the size of the performed stones. Oral administration of Crataeva nurvala bark decoction was found to be effective in calcium oxalate lithiasis in rats. The increased deposition of stone forming constituents in the kidneys of calculogenic rats was lowered with decoction administration. It has been observed that crude powder of Crataeva nurvala in the dose of 350mg/kg of body weight per day in the form of daily prepared decoction was identified to be effective against patients of calcium oxalate nephrolithiasis (33.33%) and calcium phosphate nephrolithiasis (35.71%).[37]

Patha (Cissampelos pareira Linn):
The Cissampelos pareira an extensively spreading, glabrous to soft pubescent, perennial climbing shrub found all over India and is commonly known as Patha. Patha belongs to the family of Menispermaceae In Ayurvedic system of medicine, the leaves and roots are used in the treatment of urinary tract infections. Phytoconstituent like berberine is reported for its antiurolithic activity. Berberine is an important bioactive constituent present in C.pareira So here benzyl isoquinoline alkaloid berberine is responsible for antiurolithic activity because it was therapeutically effective for both prevention as well as curative aspect of calcium oxalate urolithiasis, exhibiting these effects through a combination of antioxidant, diuretic, hypocalciuric, hypermagnesiemia and urine alkalanizing activities. Thus the present study supports and justifies the basis for folklore use of roots of C.pareira for antiurolithic activity.[38]

DISCUSSION

Among 426 drugs, 33 herbs from 9 Vargas are mentioned as Mutrashmarihara (Antiurolithiatic). Except herbs, Suvarchika (Potassium nitrate), Sugaha (Soda bicarbonet), Golochana (Bezoar), Avayika Ghrita (Ghee of sheep) are also mentioned as Mutrasmarihara. Maximum number of drugs are from Guduchyadi, Haritakyadi and Karpuradi varga and most of the drugs which act as Mutrasmarihara having Kapha-vatashamaka

(which alleviates Kapha and Vata), Laghu, rukshya (6 drugs) and Laghu, Snigdha (6 drugs) guna, Usna virya (23 drugs) and Katu vipaka (23 drugs). Main Chemical constituents proved as Mutrasmarihara Karma (Antiurolithiatic activity) are Tannin, Flavonoids, Ascorbic acid, Apigelin, Luteolin, Benzenoids, Monoterpens, Phenolic compounds, solasonine and Barberine proved by various scientific research in animals and humen beings.

21 drugs among the 37 antiurolithiatic drugs mentioned in Bhavaprakasha Nighantu are scientifically proved with the research conducted in animal and human beings as antiurolithiatic agent, the scientific study should conduct to the remaining 16 drugs for their validation. The present review conveys information about the treasure trove of medicinal plants with litholytic nature. The use of herbal remedies for prevention and cure of ailments is of increasing interest due to the superiority and efficiency of activity provided by phytoconstituents in herbs and undesirable effects of modern medicine. Evidences prove that herbal therapy is more effective than other available treatments, with lesser side effects, economic nature, no risk of long term fertility and reoccurrence.

CONCLUSION

Bhavaprakash nighantu is treastise of Indian medicinal plants, it contains various remedies among them Mutasmarihara dravya (antiurolithiatic drugs) are explained in it. As there are no satisfactory drugs in modern medicine, herbal remedies are proved to exert their effectiveness at different stages of stone pathophysiology. Many herbs themselves possess inhibitory activity against crystallization, anti oxidant activity againt free redicles and lipid peroxidation of the herbs help in preventing the urolithiatic renal cell damage, inhibite the calcium oxalate (Ca_2CO_4) crystal aggregation as well as crystal formation in the metastable solutions. Although use of herbal medicine is popular from traditional periods because of their potent activity and safety, it is of great importance to carry out further research to understand the pathophisiology of disease, mechanism of action of herbal medicines in order to develop an efficient and safe litholytic agent.

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