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## HERBAL PLANTS USED IN THE TREATMENT OF UROLITHIASIS : A REVIEW

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### ABSTRACT

Urinary stones are one of the oldest and the most common afflictions in humans . Urolithiasis is the condition where urinary *calculi* are formed or located anywhere in the *urinary system*, or the process of forming stones in the kidney, bladder, and ureters. In India, 11% people are expected to be having urinary stone problems, out of which 50% cases may lead to loss of kidneys or renal damages. So in the present review aims to give data highlighting the present trends in research of medicinal plants accredited with antiurolithiatic activity. This article may help investigators to identify lead compounds or herbal products responsible for urolithiatic activity.

**KEYWORDS** : Urolithiasis, Medicinal plants, Calcium oxalate.

### INTRODUCTION

A large number of people in this world are suffering from problems due to urinary stones. The surgical methods available to treat kidney stones like extracorporeal shock wave lithotripsy (ESWL) have serious side effects and do not give satisfactory results. Therefore, it is worthwhile to look for an alternative for the management of urolithiasis. On the other hand, the traditional system of Indian medicine "Ayurveda" recommends several medicinal plants for the treatment of urolithiasis for their safety with no side effects. Plants are known to be the source of many

chemical compounds. Medicinal plants were used by people of ancient cultures without knowledge of their active ingredients.

Urolithiasis is a recurrent renal disease affects 4-8% in UK 15% in US and 11% in India. There are several types, most commonly consisting of calcium phosphates and calcium oxalates; others are composed of magnesium ammonium phosphate, uric acid or cystine. Epidemiological data suggest that 60-80% of stone is composed mainly of calcium oxalate. Stones formation occurs when urinary concentrations of stone forming salts, exceed the limit of metastability for that salt in

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solution. This most often reflects excessive excretion of one or more stone constituents, deficient inhibitory activity in urine, or simply a low urine volume resulting in excessively concentrated urine ( Pareta S K et al., 2011).

#### **TYPE OF STONE**

There are several types of renal stones that differ in composition and pathogenesis. The most common type of kidney stone is composed of calcium oxalate and is caused by metabolic disorders that are often treatable (Barbasa C., 2002) .

#### **Calcium stones**

Most stones contain calcium combined with oxalate, phosphate, or occasionally uric acid. All calcium stones are radio-opaque, and calcium oxalate and calcium phosphate stones are black, grey, or white and small (1cm in diameter) dense and sharply circumscribed on radiographs.

**1. Hypercalciuria:** (Defined as 0.1 mmol/kg body weight of patient per day, calculated for ideal bodyweight) can be idiopathic or result from any disorder that induces even mild hypercalcemia.

**2. Hypocitrauria:** is also associated with renal lithogenesis. Citrate act in the tubular lumen by combining with calcium to form a non-dissociable but soluble complex. Hypocitrauria could result from causes of intracellular acidosis such as renal failure potassium deficiency, distal renal tubular acidosis, chronic diarrhoeal state, and drugs such as acetazolamide.

#### **Uric acid stones**

Uric acid stones are smooth, round, yellow-orange and nearly radio graphically transparent unless mixed with calcium crystals or struvite. Diets high in purines, especially those containing meats and fish, result in hyperuricosuria, and, in combination with low urine volume and low urinary pH, can exacerbate uric acid stone formation.

#### **Struvite or triple phosphate stones**

Struvite is a crystalline substance composed of magnesium ammonium phosphate. Radiographs show struvite stones as large, gnarled, and laminated. They are associated with substantial

morbidity infection. Signs of struvite stones include urinary pH greater than 7, staghorn calculi, and urease that grow bacteria on culture (proteus, klebsiella, pseudomonas).

#### **Cystine stones**

Formation of cystine stones is the only clinical expression of cystinuria, an autosomal recessive disorder. People who are homozygous for cystinuria excrete more than 600 mg per day of insoluble cystine. The stones are greenish- yellow, flecked with shiny crystallites, and are moderately radio-opaque with a rounded appearance.

#### **Protease-related stones**

This is the newest type of stone described. The increasing incidence of HIV-positive patients has led to widespread use of the protease inhibitor indinavir sulphate. Although the drug is generally well tolerated, it can be associated with urolithiasis 4–12% of patients. Thus, may coexist or form a nidus for indinavir stones vice versa.

#### **TREATMENT AND PREVENTION OF UROLITHIASIS (Orson W, 2006)**

For treatment of urolithiasis medicinal or surgical procedure is carried out. Surgical treatment like(a) Shock wave treatment which is the only non-invasive treatment for stone disease(b)Endoscopic management, both ureteroscopic and percutaneous nephrolithotomy provides an efficient way to treat stones irrespective of anatomy, composition and burden. The severe nature of renal colic has promoted a lower threshold at which narcotic analgesic, thiazide like diuretic and potassium citrate is prescribed.

#### **HERBAL PLANTS USED IN UROLITHIASIS**

Herbal drugs have created interest among the people by its clinically proven effects like immunomodulation, adaptogenic and antimutagenic. Number of medicinal plants shows antiurolithiatic activity and play vital role in prevention of disease. Here an attempt has been made to emphasis on potent indigenous herb for urinary stone

**Table 1 : List of Drug Used In Urolithiasis and Urinary Tract Trouble**

S.no	Name of the Plant	Family	Parts used	References
1	<i>Abutilon indicum</i> ( L.)	Malvaceae	Seed and Leaf extract	Prachi et al., 2009
2	<i>Aerva lanata</i> (L.)	Amarathaceae	Leaves	Soundararajan et al., 2006
3	<i>Boerhaavia diffusa</i> (L.)	Nyctaginaceae	Root	Prachi et al ., 2009
4	<i>Bergenia ligulata</i>	<u>Saxifragaceae</u>	Rhizome	Garimala et al., 2001
5	<i>Bryophyllum pinnatum</i> (Lam)	Crassulaceae	Leaves	Bhalodia ,2008.
6	<i>Bonnaya reptans</i> Spreng	Scrophalariaceae	Whole plant	Lokendrajit <i>et al.</i> 2011
7	<i>Cyamodon dactylon</i>	Poaceae	Root	Prachi et al., 2009
8	<i>Chenopodium album</i> (L.)27	Chenopodiaceae	Leaves	Sharma et al., 2011
9	<i>Centela asiatica</i> (Linn)	Umbelliferae	Whole plant	Lokendrajit <i>et al.</i> 2011
10	<i>Crateva magna</i>	Capparaceae	Bark	Mohamed et al., 2006
11	<i>Cedrus deodara</i> Roxb.	Pinaceae	Heart wood	Ramesh et al2010
12	<i>Corbichonia decumbens</i> Forrsk.(Jack).	Molluginaceae	Leaves	Neha sharma et al, 2011
13	<i>Cucumis sativus</i> L.	Cucurbitaceae	Leaves	Choubey ankur et al, 2010
14	<i>Dichrostachys cinerea</i> L.	Mimosaceae	Root	Jayakumari et al, 2011
15	<i>Dolichous biflorus</i> L.	Fabaceae	Seeds	Rana gopal singh et al 2010
16	<i>Eleusine coracana</i> Gaertn	Poaceae	Grains	Bahuguna et al 2009
17	<i>Equisetum debile</i> Roxb	Equisetaceae	All parts	Neha sharma et al
18	<i>Ficus carica</i> L.	Moraceae	Fruit, latex	Choubey ankur et al, 2010
19	<i>Gomphrena celosioides</i> Mart.	Amaranthaceae	Whole plant	Neha sharma et al.,2011
20	<i>Grewia flavescens</i> A. Juss	Tiliaceae	Roots	Neha sharma et al, 2011
21	<i>Herniaria hirsute</i> Linn	Illecebraceae	Whole plant	Rahul Deo Yadav et al., 2011
22	<i>Homonoia riparia</i> Lour	Euphorbiaceae	Root	Chitme et al, 2010
23	<i>Lantana camara</i> Linn	Verbinaceae	Leaves	Mayee et al., 2011
24	<i>Lawsonia inermis</i> Linn	Lythraceae	Leaves	Kore et al, 2011
25	<i>Melia azedarach</i> L.	Meliaceae	Leaves	Acharya Balakrishna 2008.
26	<i>Mimusops elengi</i> L.	Sapotaceae	Bark	Purnima ashok et al, 2011
27	<i>Musa paradisiaca</i> Linn	Musaceae	Ripe kernel juice	Kalpna devi et al 1993
28	<i>Ocimum sanctum</i> L.	Lamiaceae	Leaves	Acharya Balakrishna 2008
29	<i>Olea europeae</i> L.	Oleaceae	Oil	Choubey ankur et al, 2010
30	<i>Pedaliium murex</i> Linn.	Pedaliaceae	Fruits	Anantha et al, 2011
31	<i>Phyllanthus niruri</i> L.	Euphorbiaceae	Whole plant	Mirian et al, 2010
32	<i>Plantago major</i> L.	Plantaginaceae	Whole plant	Sharifa abdul aziz et al, 2005
33	<i>Ricinus communis</i> Linn	Euphorbiaceae	Root	Neha sharma et al, 2011
34	<i>Rotula aquatica</i> Lour.	Boraginaceae	Roots	Gilhotra Umesh Kr et al 2011
35	<i>Solanum Indicum</i> Linn.	Solanaceae	Roots	Prachi et al, 2009
36	<i>Tinospora cordifolia</i> Willd (L.)	Menispermeaceae	Stems	Ghatapanadi et al, 2010
37	<i>Tribulus terrestris</i> L.	Zygophyllaceae	Fruits, Roots	Satish et al, 2010
38	<i>Xanthium strumarium</i> L.	Asteraceae	Flower	Punjani B.L. 2010

39	<i>Zea mays</i> Linn	Poaceae	Decoction of styles obtained from female inflorescence or immature cells.	Prachi et al, 2009
40	<i>Zingiber officinale</i> Rosc.	Zingiberaceae	rhizomes	Prachi et al, 2009

### CONCLUSION:

As evident from the above review, nature is the best combinatorial chemistry and has possible answers to all diseases for mankind. Herbal drugs and medicinal plants play a vital role in kidney stone diseases. Also the undesirable effect of the modern medicine has already been overcome by herbal drugs which have diverted the attention of the people towards herbal medicines. To increase the acceptability and awareness among the people, there is an urgent need to develop trust and faith towards the safer indigenous system by establishing its validity in treatment for stone diseases. Health care systems are going to become more & more expensive, therefore we have to introduce herbal medicine systems in our health care.

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