



# International Journal of Medical Sciences and Pharma Research

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Review Article

## A Herbal Approach for the Treatment of Kidney Stone

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### Article Info:

#### Article History:

Received 09 Feb 2022

Reviewed 27 Feb 2022

Accepted 04 March 2022

Published 15 March 2022

#### Cite this article as:

Vishwakarma H, Thakur K, Purohit A, Jain S, Nema P, Jain PK, A Herbal Approach for the Treatment of Kidney Stone, International Journal of Medical Sciences & Pharma Research, 2022; 8(1):1-9

DOI: <http://dx.doi.org/10.22270/ijmspr.v8i1.29>

### Abstract

In ancient time people used plants as drugs. They used parts of plants like leaves, fruits, roots, stem, flowers, seeds, bark or whole plant. Traditional medicine is known as the primary health care in the world, about 70% of developing countries depends on the plant based treatment. In current scenarios most of the institutes promoting the use of plant based medicines. For the treatment of kidney stone tribal people uses several plant or juice of the plants for example *Momordica charantia*, *Moringaoliferia*, *Amnivisnaga*, *Terbulusterrestris*, *Dolichosbiflorus*, *Arvalanata*, *Cotusspiralis*, *Vaccinumoxycoccus*, *Coriendrumsativum*, *Embelicaofficinalis*, *Petroselinum crispum*, *Barosmabetulina* etc.

**Keywords:** Kidney Stone, Herbal Treatment, Medicinal Plants, Antioxidants, Uric Acid, UTIs, Cysteine, Struvite, Diuretics

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## INTRODUCTION

Kidney stone is a painful condition in which solid masses aggregates and form crystals into the kidney. Kidney stone also can be present in ureters, Bladder and urethra. There are four types of kidney stone Calcium, Uric acid, Struvite and Cystine. The Calcium type of stones are most commonly occurs in patients while uric acid type of stones occurs due to the

presence excess amount of acid in urine, uric acid type of kidney stone are more common in man than women. Struvite type of kidney stone mostly occurs in women due to the urinary tract infection and cystine type of kidney stone may present in the patients having genetic disorder cystinuria. The prevalence of renal stones is found to be around 12% in Indian population out of which approximately 5% cases are found where the patient may end up with renal failure.

## HERBAL TREATMENT OF KIDNEY STONE

S. no	Name of Drug	Biological Source	Family	Chemical Constituents	Uses	Properties used in kidney stone
1.	Coriander	Seeds and leaves of <i>Coriendrum sativum</i> <sup>1</sup>	Umbelliferae/ Apiaceae <sup>2</sup>	It contains 0.5-1 % essential oil.  It is rich in advantageous phytonutrients including carvone, geraniol, limonene, borneol, camphor, elemol and linalool.  Coriander's flavonoids includes quercetin, kaempferol, rhamnetin and	It is used as antidiabetic, anti-inflammatory and cholesterol lowering.  it is also used as carminative, stimulant, stomachic, refrigerant, aphrodisiac,	Anti-inflammatory and Carminative

				<p>epigenin.</p> <p>Also contains active phenolic acid compounds including caffeic acid and chlorogenic acid<sup>3</sup>.</p>	<p>analgesic, anthelmintic and hypoglycaemic<sup>3</sup>.</p> <p>This plant may have antimicrobial properties against food borne pathogens such as Salmonella species<sup>4</sup>.</p> <p>Used in respiratory infection<sup>5</sup>.</p>	
2.	Cranberry	Fruit extract of <i>Vacciniumoxycoccus</i> ) <sup>6</sup> .	<i>Ericaceae</i> <sup>6</sup> .	<p>It contains anthocyanidin, flavonoids, cyanidin, peonidin and quercetin</p> <p>It also contain proanthocyanidins<sup>7</sup>.</p>	<p>Cranberry extracts, cranberry juice and cranberry tincture Used for the treatment of UTIs<sup>8,9</sup>.</p> <p>daily consumption of concentrated cranberry juice can significantly prevent the recurrence of symptomatic UTIs in children<sup>10</sup>.</p> <p>Proanthocyanidins have ability to prevent E. coli, which is the most common cause of bacterial UTIs.</p> <p>The constituents of cranberry juice also show efficacy against formation of kidney stones<sup>10</sup>.</p>	Cranberry juice uses in bacterial infection and it shows the efficacy against the formation of kidney stones.
3.	Blueberry	Fruits of <i>Vacciniumcorymbosum</i> ) <sup>11</sup> .	<i>Ericaceae</i>	<p>It's leaves are rich in phenolics.</p> <p>Eight predominant phenolics were quantified including five caffeoylquinic acids, two quercetin glycosides, and one kaempferol glycoside.</p> <p>The blueberry leaves may be a potential resource of antioxidant phenolics, catechin, Gallic acid, and rutin 4-O-caffeoylquinic acid, 3,5-dicaffeoylquinic acid, 4,5-dicaffeoylquinic acid, quercetin-3-O-galactoside, quercetin-3-O-glucoside and kaempferol-3-O-glucoside<sup>12</sup>.</p>	<p>It is use as an Antioxidant.</p> <p>It have preventive effects against cataracts, premature aging, and anaemia<sup>12</sup>.</p> <p>It has been used to treat and prevent UTIs.</p> <p>cranberry juice may reduce the number of symptomatic UTIs over a 12-month period, particularly in women with recurrent UTIs<sup>13</sup>.</p> <p>it have bioactive compounds that inhibit the ability of E. coli to adhere to the walls of the bladder.</p>	<p>It reduces the symptoms of UTIs.</p> <p>Also inhibit the ability of E. coli to adhere to the walls of the bladder.</p>
4.	Uvaursi	Leaves and stem of <i>Arctostaphylosuvaursi</i> <sup>14</sup> .	<i>Ericaceae</i>	Uvaursi leaves contain a glycoside known as arbutoside (arbutin) <sup>15</sup> .	This herb is approved in Germany for treatment of	Uses in the treatment of cystitis and

				<p>It contains phenoglycosides and flavonoids including antocyanes, hydroxycinnamic acids, saponins, lignans, iridoides, polysaccharides and essential oils in the stems and leaves of the bearberry.</p>	<p>cystitis<sup>16</sup>.</p> <p>Arbutin exhibits an antibacterial effect and act as mild diuretic.</p> <p>It has been used for urinary tract complaints, including cystitis and urolithiasis<sup>17,18</sup>.</p> <p>Arbutoside forms glucose and hydroquinone in the gut.</p> <p>Hydroquinone becomes glucuronidated after reaching the liver post absorption.</p> <p>When the urinary pH reaches seven, the Glucuronide portion declines after renal excretion, this provide the hydroquinone, the ability to take action in opposition of urinary infective agents.</p>	<p>urolithiasis.</p> <p>It is a mild diuretic.</p> <p>Active against urinary infective agents.</p>
5.	Horseradish	Roots of <i>Armoracia rusticana</i> <sup>19</sup> .	Brassicaceae	<p>It is rich in vitamin C<sup>20</sup>.</p>	<p>Its roots have been used to treat various health problems including urinary tract infections, bronchitis, sinus congestion, in growing toe nails and coughs.</p> <p>It is also a stimulant, diuretic, diaphoretic, rubefacient and antiseptic.</p> <p>It's constituents may have antibacterial activity<sup>21,22</sup>.</p> <p>Horseradish's volatile oil also exhibits an antibacterial effect on the bacteria that can cause UTIs<sup>23</sup>.</p>	<p>It is used in urinary tract infections.</p> <p>It is uses as diuretics.</p>
6.	Goldenseal	<i>Hydrastis Canadensis</i> <sup>24</sup> .	Ranunculaceae	<p>It contains the isoquinolinealkaloids: berberastine, plantain, hydrastinine, hydrastine, berberine, tetrahydroberberastine, canadine, and canalidine<sup>25</sup>.</p>	<p>Berberine prevents UTIs by inhibiting bacteria from adhering to the wall of the urinary bladder<sup>26</sup>.</p> <p>Therefore,</p>	<p>Goldenseal is used in the treatment of urinary tract infection.</p>

					<p>goldenseal and some other plants which contains berberine can act as an aid in the treatment of Urinary Tract Infections.</p> <p>Because of the anti-inflammatory effects of plaintain, it may be beneficial in some people with UTIs. Though it is not clinically proven<sup>27</sup>.</p>	
7.	Yarrow	Aerial part of <i>Achillea millefolium</i> <sup>28</sup>	Asteraceae <sup>29</sup>	It contains isovaleric acid, salicylic acid, asparagine, sterols, flavonoids, bitters, tannins, and coumarins.	<p>It has astringent effects<sup>30</sup>.</p> <p>It is a urinary disinfectant with a powerful antibacterial action and astringent effect that helps tone weak bladder tissues.</p> <p>Recommended for women with incontinence<sup>31</sup>.</p> <p>It is used for mucus conditions, as a bitter digestive tonic to increase bile flow, and as a diuretic, treatment of the Amenorrhea, anti-inflammatory, bowels, bleeding, blood clots, blood pressure (lowers), blood purifier, blood vessels (tones), catarrh (acute, repertory), colds, chicken pox, contraceptive (unproven), cystitis, diabetes treatment, dyspepsia, eczema, fevers, flu's, gastritis, glandular system, gum ailments, heartbeat (slow), influenza, insect repellent, internal bleeding, liver (stimulates and regulates), lungs (haemorrhage), menstruation (regulates, relieves pain), nosebleeds, piles (bleeding), smallpox, stomach sickness, toothache, thrombosis, ulcers,</p>	<p>The yarrow is used as diuretics and for tighten and contract the uterus.</p> <p>It is also used as a urinary antiseptic.</p>

					urinary antiseptic, uterus (tighten and contract), varicose veins, and vision <sup>32</sup> .	
8.	Echinacea	Flowers of <i>Echinacea purpurea</i> <sup>33</sup>	Asteraceae (Compositae)	Cortisone, polyunsaturated alkamides, polysaccharides – including arabinogalactans, fructofuranosides and heteroxylans <sup>3</sup> . Three groups of phytochemicals are determined such as caffeic acid derivatives, polysaccharides and lipophilic alkamides, which are responsible for the genus medicinal properties, contains alkamides, cichroic acid and polysaccharides <sup>35</sup> .	It's active substances increase the activity of the immune system, relieve pain, reduce inflammation, and have hormonal, antiviral, and antioxidant effects. Cortisone inhibits hyaluronidase enzyme antibacterial properties against <i>Staphylococcus aureus</i> , <i>Corynebacterium diphtheriae</i> and <i>Proteus vulgaris</i> <sup>36</sup> .	Antioxidant
9.	Dandelion	<i>Taraxacum campyloides</i> <sup>37</sup>	Compositae	Dandelion is a rich source of vitamins A, B complex, C, and D, as well as minerals such as iron, potassium, calcium and zinc.  The other active constituents of Dandelion include taraxacin, taraxacoside, inulin, phenolic acids, sesquiterpene lactones, triterpenes, coumarins, catotenoids and minerals a source of potassium <sup>38</sup> .	It is a natural diuretic that enhances urine production by initiating the excretion of salts and water from the kidney.  It can be used for a wide range of conditions requiring mild diuretic treatment, such as poor digestion, liver disorders, and high blood pressure.  it relieves false sensations of urgency and also restores normal liver function <sup>39</sup> .	It is used as a natural diuretics.
10.	Buchu	<i>Agathosmabetulina</i> <sup>40</sup> .	Rutaceae	Agathosmabetulina contain limonene, menthone, diosphenol, l-pulegone and (-)-diosphenol (an isomer of diosphenol).  The other species, Agathosmacrenulata contains limonene, menthone, a trace of diosphenol and large amounts of l-pulegone.	It is a diuretic and a urinary disinfectant, stimulates urination and soothes burning sensation during urination, prevent periodic attacks of chronic cystitis or urethritis.  buchu is also taken for prostatitis and irritable bladder.  Agathosmabetulina uses in the treatment of kidney stones and urinary tract infection and also use for the	It can be use in the treatment of kidney stones due to its diuretic effect.  It is also uses as urinary disinfectant.

					<p>relief of calculus.</p> <p>Pulegone is known to be an abortifacient buchu's herbal uses, but its diuretic and anti-inflammatory effects herbal medicine for urinary tract ailments, cystitis or urethritis prophylaxis and prostatitis<sup>41</sup>.</p>	
11	Cleavers	<i>Galium aparine</i> <sup>42</sup>	Rubiaceae <sup>43</sup>	<p>In regards of the antioxidant properties polyphenols are considered to have constituents of significance.</p> <p>Anthraquinones, alkanes irioids, tannins, flavonoids, polyphenolic acids and vitamin E are the active constituents of Galium aparine that act as a contributing factor to the natural antioxidant composition.</p>	<p>It is a therapeutic spice, customarily used to treat skin infections.</p> <p>It has a diuretic activity, supporting disposal of squanders, and furthermore acts to upgrade the lymphatic framework, advancing lymphatic seepage of poisons and squanders<sup>44</sup>.</p> <p>It is a diuretic and treat other intense and fiery urinary illnesses like intense and constant cystitis<sup>39</sup></p> <p>Utilized effectively in asthma, hack, and ongoing bronchitis, and seems to apply an impact chiefly upon the respiratory organs<sup>45</sup>.</p>	Its antioxidant property.
12	Parsley	<i>Petroselinum crispum</i> <sup>46</sup>	Apiaceae	Vitamin A & C, Myristicin <sup>47</sup> .	<p>It decreases irritations, contains receptor inhibitors and is a free radical scavenger. Its diuretic effects are mediated through an inhibitory action on the sodium-potassium pump, thereby enhancing sodium and water excretion while increasing potassium reabsorption.</p> <p>The essential oil apiole found in all parts of parsley is a proven kidney stimulant. It is also</p>	Its diuretic effect and kidney stimulant effect

					used as a tonic to strengthen the bladder Myristicin, an active component of parsely, may also cross the placenta and increase the heart rate of the fetus <sup>47</sup> .	
13	Juniper	<i>Juniperusosteosperma</i>		alpha pinene, cadinene, camphene and terpineol <sup>16</sup> .	It is a herbal remedy for urinary tract infections, to treat diabetes and as a female contraceptive. Juniper contains aromatic compounds that increase the flow of urine, Its leaves are diuretic, by increasing urinary volume and apparently helping to flush bacteria out of the urinary tract <sup>16</sup> often used as a diuretic, antiseptic and stimulant, used for treatment of chronic cystitis, antimicrobial actions.	Its diuretic function and use in cystitis.
14	Amla	<i>Emblica officinalis</i> <sup>48</sup>	Euphorbiaceae	It contains hydrolysable tannins, emblicanin A, emblicanin B, punigluconin and pedunculagin. Emblicanin An and B, gallic acid, ellagic acid, 1-O-galloyl-beta-D-glucose, 3,6-di-O-galloyl-Dglucose, chebulinic acid, quercetin, chebulagic acid, corilagin, 1,6-di-O - galloyl beta D glucose, 3 Ethylgallic acid (3 ethoxy 4,5 dihydroxy benzoic acid) and isostrictiniin. Phyllanthusemblica also contains flavonoids, kaempferol 3 O alpha L (6'' methyl) rhamnopyranoside and kaempferol 3 O alpha L (6''ethyl) rhamnopyranoside <sup>48</sup> .	The product of <i>Embelica officinalis</i> is diuretic, dried products of amla are utilized to treat discharge, looseness of the bowels and diarrhea, adaptogenic, hepatoprotective, antitumor, hypocholesterolemic . cancer prevention agent and antiulcerogenic  The natural products are additionally answered to be calming, analgesic and antipyretic, cancer prevention agent movement exhibited strong antimicrobial properties of <i>E. officinalis</i> .  It utilized generally in the treatment of	Its antioxidant property



					lungs.  It has additionally shown antifungal action in vitro <sup>49-59</sup> , dynamic against Staphylococcus aureus, E-coli, Mycobacterium tuberculosis, Salmonella typhus and Candida albicans <sup>60</sup> .	
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