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A Review on Antiurolithiatic (Pashanabeda) Effects of Herbal and Marine Resources

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Review Article

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ABSTRACT

Urolithiasis (urinary calculi) is stone development in bladder, urinary tract and kidney. The rise in frequency and occurrence of kidney stones is talking point all over the world. 12% of the global population suffer from urinary stone formation. The phenomenon effect of urolithiasis is lowered by using the pashanabeda elements. Pashanabeda (Pashan: stone; bheda: to break) is a Sanskrit locution which implies the breakage of stone. The adverse reactions caused due to man made drugs has prompted to rejoin with the natural safe medication. The evolution of plant-based therapeutics has shown terrific notice and demand as an modernistic drug entities all over the sphere. The present review aims the investigators to easily identify and develop plant and marine resources beneficial in management of urolithiasis.

Keywords: Urolithiasis; antiurolithiatic; pashanabeda; herbal; animal; marine; microbial; mineral.

1. INTRODUCTION

Humankind is known to be suffering from urinary stone disease since ancient times, and it was first found in tombs of Egyptian mummies dating back to 4000BC and in the graves of North American Indians from 1500 BC – 1000BC [1].

2. UROLITHIASIS OR NEPHROLITHIASIS

Urolithiasis or nephrolithiasis is one of the oldest and endemic painful urological disorder [2-10]. The genesis of stone in urinary system i.e., in the kidney, ureter and urinary bladder or in the

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urethra is known as urolithiasis (ouron =urine, lithos = stone) [11].

World population of 3-20% have propensity to form single urinary stone in their lifespan of 70 years [12]. 12% of global population suffer from urinary stone formation [13].

The average lifetime risk of stone formation has been reported in the range of 5-10% population in which there is a predominance of men over women. A handful of lithiogenic factors that leads to formation of stones such as sexuality, age, profession, food habits, water intake, education level, national diffusion, socioeconomic status, metabolic and genetic disorders and diseases (Mohammad Shazib Faridi et al. 2020); [14,15].

3. MECHANISM OF URINARY STONE FORMATION

Stone genesis is complicated process which results because of succeeding Physicochemical occurrences such as excellent saturation, growth, nucleation, retention and aggregation within the renal tubules.

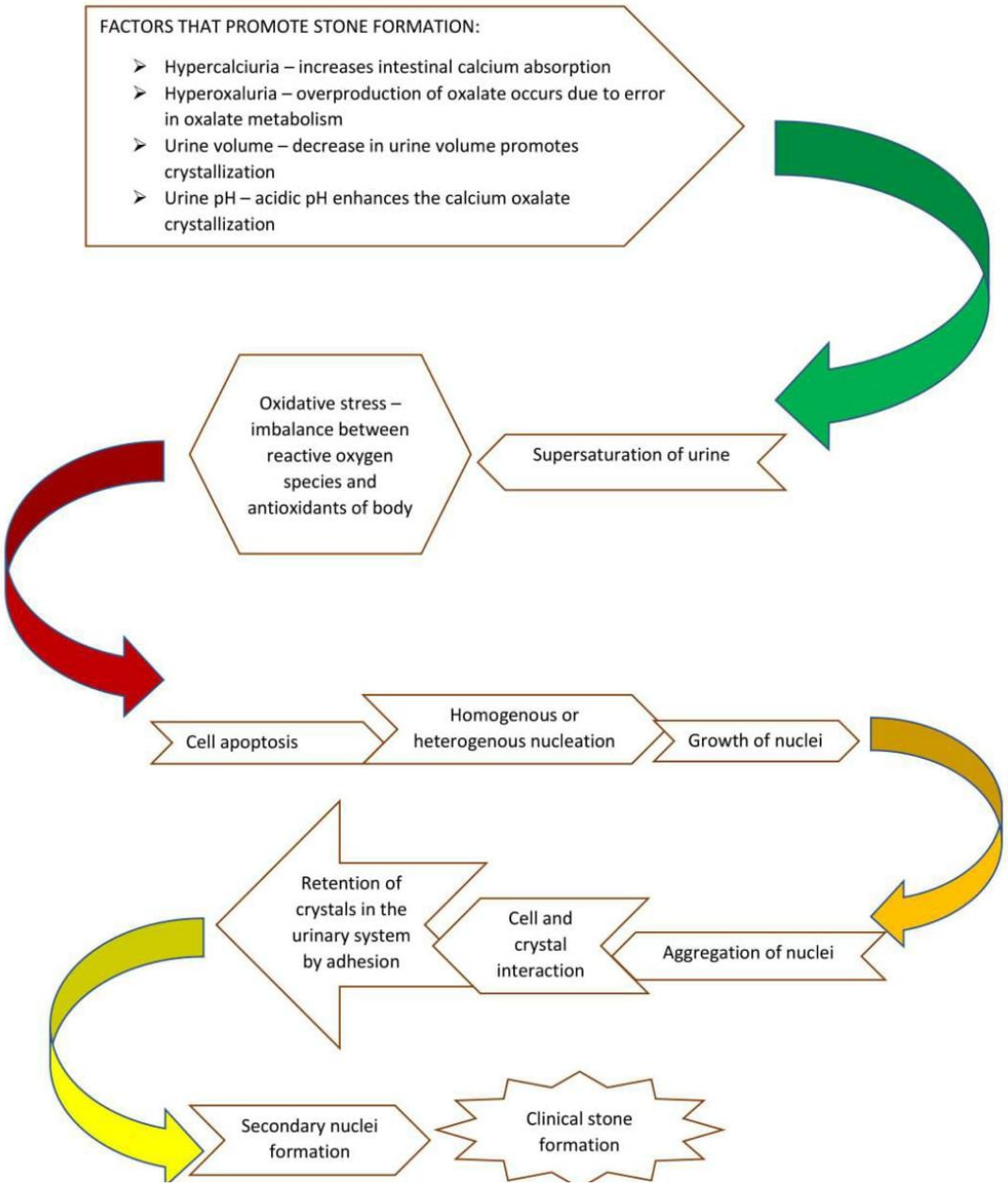

Fig. 1. Flowchart of mechanism of urinary stone formation

The mechanism of stone formation comprises seedling of stone crystals (nuclei formation, nucleation), assemblage of nuclei to interact with inter renal structure (aggregation) and thus maintain themselves in renal system further aggregate to from secondary nuclei which shape into clinical stone (crystal development) [16].

Constituents of stone components may differ, but the severity it causes may vary based on its site, severity of stone formation and its action at site.

The mechanism of stone formation is depicted in flowchart format as indicated below.

3.1 Types of Urolithiasis

The kidney stone size varies from 5mm to 7mm. different types of kidney stones are included in table format. The type of stone formed is named after its mineral composition. The most frequent stones are struvite (magnesium ammonium phosphate), calcium oxalate, urate, cysteine and silica [13].

3.2 Pashanabheda

Pashanabeda is a Sanskrit phrase where the word Pashan means stone and bheda means to break, which literally means the breakage of stones. Several plants such as Bergenia ligulate syn., Saxifrega ligulate etc. are denominated as pashanabeda as they show properties similar to that of water pills and lithiotriptic activities which is included in classics of Ayurveda. (www.ccras.nic.in) [17].

3.3 Antiurolithiatic Activity

The components that reduce the stone shaping components in urine and reduce renal retention are known as antiurolithiatic components. The activity is known as antiurolithiatic activity.

Table 1. Types of kidney stones [13]

S. No.	Types of kidney stones	Percentage of occurance	Causes for kidney stones	Characteristic feature of stones
1.	Calcium stones	-	Calcium combines with oxalate and phosphate to form calcium oxalate and calcium phosphate stones. The rise in oxalate and phosphate levels in dietary supplements leads to formation of stones	White, black or grey colored components, radio opaque
2.	Struvite stones	10-15%	Stones are formed due to bacterial infections	Large, glared and laminated
3.	Uric acid stones	5-10%	People with malformation like gout syndrome, obesity and food source rich in purine, protein (meat & fish) results in stone formation	Yellow orange colored, smooth, round or square or diamond or rod shape, pleomorphic
4.	Protease related stones	4-12%	Formation of crystals are recognized in HIV positive patients using protease inhibitors (indinavir sulphate)	-
5.	Cysteine stones	-	Hereditary disorders induce formation of stones	Greenish yellow color, round, shiny, radiopaque
6.	Silica stones	-	Synthetic and herbal medicines induce formation of stones. These are crystal called as drug induced stones	-

This review article mainly focuses on various plants and marine accredited with diuretic and antiurolithiatic activities.

4. METHODOLOGY

The components are classified into natural sources and synthetic sources. Natural sources are further classified into herbal source, animal source, marine source, microbial source and mineral source.

4.1 Herbal Sources

The plants that show antiurolithiatic activity and diuretic activity are classified based on their morphological characteristics and depicted examples in alphabetical order. It is further depicted in the form of table as shown below (Table 2) [18].

4.2 Animal Source

The animal source with lithiolytic activity are listed in Table 3 [1].

4.3 Marine Sources

The marine source with antiurolithiatic activity and diuretic property are listed in Table 4 [1].

Table 2. Plants with antiurolithiatic and diuretic activity

S.No.	Class (Root)	Antiurolithiatic plants
1.	*Abutilon muticum* (Delile ex DC.)	*Hygrophila auriculata*
	Achyranthus aspera L.	*Hygrophila schulli*
	Acorus calamus	*Ichnocarpus frutescens* (L.) W.T.Aiton
	Aerva javanica	*Indigofera tinctoria*
	Ageratum conyzoides	*Juniperus chinesis* .
		Juniperus polycarpos K.Koch
	Alcea fasciculiflora Zohary	
	Alhagi mannifera Jaub. & Spach	*Lawsonia inermis* L.
	Alhagi maurorum Medik.	*Levisticum officinale*
	Alisma orientale (Sam.) Juz.	*Medicago sativa* L.
	Angelica sinesis polysaccharide	*Mimosa pudica* L.
	Apium graveolens L.	*Moringa oleifera root-wood*
	Aquilegia fragrans Benth.	*Musa balbisiana* Colla.
	Arctium lappa	*Musa* × *paradisiaca* L.
	Arnebia euchroma	*Nothosaerva brachiate* (L.) Wight.
	Asclepias syriaca L.	*Ononis spinosa*
	Asparagus officinalis	*Petroselinum crispum*
	Asparagus racemosus	*Petroselinum sativum*
	Asparagopsis adscendens Kunth. / *Asparagus officinalis*	*Phragmites australis* (Cav.) Trin. Ex Steud.
	Anneslea fragrans Wall. / *Aquilegia fragrans* Benth.	*Piper methysticum* G.Forst.
	Barbaarea vulgaris R.Br.	*Plantago major* L.
	Barleria prionitis L.	*Raphanus sativus* L.
	Berberis vulgaris	*Rheum emodi* Wall.
	Bergenia ciliate	*Ribes triste* Pall.
	Beta vulgaris L.	*Ricinus communis* L.
	Biophytum abyssinicum Steud. Ex A. Rich.	*Rotula aquatica* Lour.
	Biophytum reinwardtii	Rubia tinctorum
	Biophytum sensitivum L.	*Rubus caesius* L.
	Boerhavia diffusa	*Rubus fruticosus* Lour.
	Caesalpinia nuga (Aiton.)	*Rubus sanctus* Schreb.
	Celosia argentea	*Rumex acetosella*
	Ceterach aureum Buch.	*Rumex hastatus*
	Chondrodendron tomentosum Ruiz & Pav.	*Saccharum officinarum*
	Cissampelos parerira L.	*Saccharum spontaneum*
	Citrus limon (L.) Osbeck	*Sageretia brandrethiana* Aitch.
	Clerodendrum serratum	*Saponaria mesogitana* Boiss.

S.No.	Class (Root)	Antiurolithiatic plants
	Clitoria ternatea	*Scoparia dulcis* L.
	Coccinia grandis	*Sida rhombifolia*
	Coix lacryma-jobi	Smilax aspera
	Costus arabicus	*Solanum anguivi* Lam.
	Costus igneus	*Solanum incanum* L.
	Crotalaria albida Roth.	*Solanum surattense* Burm.f.
	Crotalaria pallida Aiton.	*Solanum virginianum* L.
	Cucumis sativus L.	*Sphaeranthus indicus* L.
	Cynara scolymus L.	*Strychnos potatorum* L.f.
	Cynodont dactylon (L.) Pers.	*Taraxacum officinale*
	Daucus carota L.	*Tectona grandis*
	Ecbolium viride(Forssk.) Alston	*Tephrosia purpurea*
	Echinops spinosus L.	*Tinospora purpuea*
	Ensete superbum (Roxb.) Cheesman.	*Traxacum pseudobrachyglossum* Soest.
	Eryngium creticum Lam.	*Trianthema portulacastrum*
	Eupatorium purpureum L.	*Tribulus terrestris*
	Filipendula vulgaris Moench	*Tropaeolum tuberosum* Ruiz & Pav
	Glycyrrhiza glabra L.	*Valeriana officinalis* L.
	Gypsophila struthium Loefl.	*Valeriana wallichii* DC.
	Hamelia patens Jacq.	*Vetiveria zizanioides*
	Hemidesmus indicus	*Vitex negundo*
	Helianthus annuus	*Xanthium strumarium*
	Homonia riparia Lour.	*Xenostegia tridentata* Webb & Berthel
	Holarrhena antidysenterica	*Zaleya pentandra* (L.) C.Jeffrey
	Hydrangea arborescens L.	*Ziziphus lotus* (L.) Lam.
2.	**Rhizome**	
	Agropyron repens (L.) P. Beauv.	*Cynodon dactylon*
	Asparagus racemosus Willd	*Elymus repens*
	Bergenia ligulate Engl.	*Eupatorium purpureum*
	Beta vulgaris L.	*Hedychium coronarium* J. Koenig.
	Colocasia esculenta (L.) Schott.	*Smilax lanceifolia* Roxb.
	Curculigo orchioides Gaertn.	*Zingiber officinale* Roscoe
3	**Bulb**	
	Allium cepa L.	*Drimia indica* (Roxb.) Jessop
	Allium sativum L.	*Scilla indica* Roxb.
4	**Aerial Parts**	
	Achillea falcata L.	Gymnocarpus *decandrum* Forssk.
	Arnica montana L.	*Geranium robertianum* L.
	Cardamine uliginosa M.Bieb.	*Helichrysum plicatum* DC.
	Chimaphila maculate (L.) Pursh.	*Herniaria glabra* L.
	Chimaphila umbellate (L.) Nutt.	*Hyparrhenia hirta* (L.) Stapf.
	Cocculus hirsutus (L.) W.Theob.	*Lolium perenne* L.
	Crataegus monogyna	*Melilotus officinalis* (L.) Pall.
	Crataegus pentagyna	*Orthosiphon aristatus* (Blume) Miq.
	Cyperus longus	*Prosopis farcta* (Banks & Sol.)J.F.Macbr.
	Derris trifoliata Lour.	*Salvia canariensis*
	Equisetum ramosissimum	*Verbena officinalis* L.
	Equisetum telmateia .	*Zilla spinosa* (L.) Prantl.
5	**Bark**	
	Ammi visnaga (L.) Lam.	*Juniperus communis*
	Bauhinia purpurea L.	*Laurus nobilis* L.
	Betula pendula Roth.	*Lawsonia inermis* L.
	Berberis vulgaris L.	*Macaranga peltate*
	Cinnamonum aromaticum Nees.	*Mimusops elengi* L.
	Cinnamonum bejolghota (Buch. – Ham.)	*Moringa pterygosperma* Gaertn

S.No.	Class (Root)	Antiurolithiatic plants
	Sweet	
	Cinnamomum verum J. Presl.	*Neolamarckia cadamba* (Roxb.) Bosser.
	Clitoria ternatea L.	*Olea europaea* L.
	Cedrus deodara (Roxb. Ex D. Don) G.	*Picea mariana* (Mill.) Britton, Sterns & Poggenb
	Crateva adansonii subsp	Raphanus sativus L.
	Crataeva magma (Lour.) DC	*Saraca asoca* (Roxb.) Willd.
	Crataeva nurvala	*Sonchus oleraceus* (L.) L.
	Holarrhena pubescens	*Terminalia arjuna*
	Hydrangea arborescens	*Zizipus lotus*
6	**Stem**	
	Achyranthus aspera L.	*Hedychium aurantiacum* Roscoe.
	Butea monosperma (Lam.) Taub.	*Musa × paradisiaca*
	Bryonia alba L.	*Silybum marianum* (L.) Gaertn.
	Eryngium campsetre L.	*Ruscus aculeatus* L.
	Equisetum arvense L.	*Tinospora cordifolia* (Willd.) Miers.
7	**Bamboo Shoots**	*Bambusa nutans* Wall.ex Munro
8	**Leaves**	
	Aaronsohnia pubescens (Desf.) K.Bremer & Humphries.	*Hypericum hypericoides*
	Adiantum capillus-veneris	*Ilex aquifolium* L.
	Allium odorum L.	*Larrea tridentata*
	Alternanthera brasiliana	Launaea procumbens L.
	Althaea officinalis L.	*Lavandula stoechas* L.
	Amaranthus blitum	*Lepidium latifolium* L.
	Amaranthus caudatus	*Lithospermum officinale* L
	Ammi visnaga (L.) Lam.	*Melia azadirachta* L.
	Anisotes trisulcus (Forssk.) Nees	*Mentha arvensis* .
	Anacardium occidentale L.	*Mentha spicata* .
	Anneslea fragrans Wall. / *Aquilegia fragrans* Benth.	*Mimosa pudica* L.
	Arctostaphylos pungens	*Moringa oleifera* Lam.
	Arctosyaphylos uva ursi	*Musa × paradisiaca* L.
	Argyreia nervosa (Burm. f.) Bojer.	*Ocimum sanctum*
	Asphodelus tenuifolius Cav	*Ocimum tenuiflorum* L.
	Asplenium ceterach L.	*Oenothera biennis* L.
	Asplenium hemionitis L.	*Olea europaea*
	Asplenium scolopendrium L.	*Oxalis corniculate* L.
	Arum rupicola Boiss.	*Paronychia argentea* Lam.
	Azadirachta indica A. Juss.	*Paederia foetida* L.
	Basella alba L.	*Peperomia pellucida* (L.) Kunth
	Barbarea vulgaris R.Br.	*Phyllanthus niruri*
	Bauhinia forficata Link	*Phyllanthus lanceolatus* Poir.
	Berberis integerrima Bunge.	*Picea smithiana* (Wall.) Boiss.
	Betula pendula Roth.	*Piper aduncum* L.
	Betula lenta L	*Piper longum* L
	Betula utilis D Don.	*Plantago lanceolata* L.
	Biophytum abyssinicum Steud. Ex A. Rich.	*Plectranthus amboinicus* (Lour.) Spreng.
	Boldoa purpurascens cav	*Polygonum cognatum* Meisn.
	Brassica napus L.	*Populus alba* L.
	Bryophyllum calycinum Salisb.	*Portulaca oleracea*
	Cassia auriculata L.	*Prosopis farcta*
	Calendula officinalis L.	*Pulmonaria officinalis* L.
	Carissa opaca Stapf ex Haines.	*Raphanus sativus* L
	Celastrus paniculatus	*Rosa canina* L.
	Celtis timorensis .	*Rosmarinus*

S.No.	Class (Root)	Antiurolithiatic plants
	Chenopodium album L.	*Rubus caesius*
	Chimaphila maculate (L.) Pursh.	*Ruscus aculeatus* L.
	Cichorium intybus L.	*Ruta graveolens* L.
	Cissus adnata Roxb.	*Sapium sebiferum* (L.) Roxb.
	Cissus gongylodes (Baker)	*Saponaria mesogitana* Boiss.
	Coleus amboinicus Lour	*Smilax aspera* L.
	Corallodiscus lanuginosus	*Solidago virgaurea* L.
	Coriandrum sativum L.	*Spergularia rubra*
	Crataegus aronia (L.) Bosc ex DC.	*Spermacoce hispida* L
	Cucumis sativus L.	*Stachytarpheta indica* (L.) Vahl.
	Cyclea peltata (Lam.) Hook.f. & Thomson	*Tephrosia purpurea* (L.) Pers.
	Didymocarpus pedicellatus R.Br.	*Teucrium polium* L
	Duranta erecta	*Thunbergia alata* Bojer ex Sims.
	Ecbolium viride (Forssk.) Alston	*Thymus kotschyanus*
	Eleusine indica Linn. (poaceae)	*Thymus migricus*
	Enicostema axillare (Poir. ex Lam.) A. Raynal.	*Tinospora purpuea* (L.) Pers.
	Eriobotrya japonica (Thunb.) Lindl.	*Tinospora cordifolia* (Willd.) Miers.
	Eupatorium birmanicum DC.	*Tournefortia acuminata* A.DC.
	Ficus carica L.	*Trapogon buphtalmoides* (DC.) Boiss.
	Fraxinus excelsior L.	*Trianthema portulacastrum* L
	Forsskaolea tenacissima L.	*Tribulus terrestris* L.
	Glechoma hederaceae L.	Triclisia gilletti
	Hedera helix L.	*Vitis vinifera*
9	**Flowers**	
	Alcea pallida (Willd.) Waldst. & Kit.	*Inula oculus-christi* L
	Anthemis nobilis L.	*Matricaria chamomilla* L.
	Borassus flabellifer L.	*Moringa oleifera* Lam.
	Cassia occidentalis L.	*Musa* × *paradisiaca* L.
	Calendula officinalis L.	*Opuntia ficus-indica* (L.) Mill.
	Cocus nucifera L.	*Panicum miliaceum* L.
	Cymbopogon schoenanthus (L.) Spreng.	Phlogacanthus thyrsiformis Hardow (Mabb)
	Echinops spinosus L.	*Rosa canina* L. (rose hips)
	Eryngium campestre L.	*Rosa indica* L.
	Helichrysum arenarium (L.) Moench	*Rubus fruticosus* Lour.
	Helichrysum plicatum DC. Subsp. plicatum	*Solidago virgaurea* L.
	Hibiscus sabdariffa L.	*Taraxacum hybernum* Steven
		Zea mays L. (tea of corn silk)
10	**Fruits**	
	Ammi visnaga (L.) Lam.	*Neolamarckia cadamba*
	Aegle marmelos (L.) Correa	*Nigella sativa*
	Ananas comosus (L.) Merr.	*Paeonia officinalis*
	Artemisia abrotanum L.	*Peganum harmala*
	Averrhoa carambola L.	*Pedalium murex*
	Ananas comusus (L.) Meerr.	*Peucedanum grande* C.B.Clarke.
	Benincasa hispida (Thunb.) Cogn.	*Phillyrea latifolia* L.
	Bombax ceiba L.	*Phyllanthus emblica* L.
	Brassica oleracea L.	*Physalis alkekengi* L
	Bunium persicum	*Pinus brutia* Ten
	Cannabis sativa L	*Pinus eldarica* Medw.
	Cassia fistula L.	*Piper cubeba*
	Cordia ecalyculata Vell.	*Piper longum* .
	Cordia grandis Roxb.	*Piper nigrum*
	Citrullus vulgaris	*Pimpinella anisum*
	Cucumis melo	*Platanus orientalis*

S.No.	Class (Root)	Antiurolithiatic plants
	Cucumis sativus	*Prunus avium*
	Elettaria cardamomum (L.) Maton.	*Punica granatum*
	Emblica officinalis Gaertn	*Rosa canina*
	Gmelina arborea Roxb.	*Rhus succedanea* L.
	Gossypium herbaceum L.	*Ruscus hypoglossum* L.
	Ficus carica L.	*Rubus ellipticus*
	Ficus palmata Forssk.	*Rubus fruticosus*
	Foeniculum vulgare Mill.	*Serenoa repens* (W.Bartram) Small
	Juniperus pseudosabina Fisch. & C.A.Mey.	*Solanum xanthocarpum*
	Kigelia pinnata (Jacq.) DC.	*Spondias axillaris* Roxb.
	Lagenaria siceraria (Molina) Standl.	*Syzygium cumini*
	Levisticum officinale	*Tamarindus indica* L.
	Lithospermum officinale	*Tribulus terrestris* L.
	Manilkara zapota	*Trigonella foenum-graecum* L.
	Momordica cochinchinensis (Lour.) Spreng.	Viburnum opulus L.
	Morinda citrifolia	*Xenostegia tridentata*
11	**Seeds**	
	Alcea pallida (Willd.) Waldst & Kit.	*Nigella sativa* L.
	Celosia argentea L.	*Phaseolus vulgaris* L.
	Ensete superbum (Roxb.) Cheesman	*Piper nigrum*
	Holarrhena pubescens	*Pongamia pinnata*
	Lupinus varius subsp.varius	*Raphanus sativus* L.
	Macrotyloma uniflorum (Lam.) Verdc.	Trachyspermum ammi
	Manilkara zapota (L.) P. Royen (kernel)	*Trionella foenum-graecum* L.
	Momordica cochinchinensis (Lour.) Spreng.	*Vigna unguiculata* (L.) Walp.
	Myrtus communis L.	
12	**Whole plant**	
	Achillea millefolium L.	*Gallium verum* L.
	Achyranthes aspera	*Haloxylon stocksii* (Boiss.) Benth. & Hook. f.
	Acmella oleracea	*Heliotropium crispum* Desf.
	Actinodaphne angustifolia Nees.	*Herniaria hirsute* L.
	Aeonium canariense (L.) Webb & Berthel	*Hypericulum montbretii* Spach.
	Aerva lanata	*Kalimeris indica* (L.) Sch. Bip.
	Ajuga chamaepitys (L.) Schreb.	*Lamium album* L.
	Ammi majus L.	*Lemanea fluviatilis* L.
	Alcea flavovirens (Boiss.) Boiss	*Lindernia ruellioides* (Colsm.) Pennnell.
	Alisma plantago-aquatica L.	*Ludwigia perennis* L.
	Alternanthere tenella colla	*Malvella sherardiana* (L.) Jaub. & Spach.
	Amaranthus spinosus L.	*Meiogyne minuta* (G.Forst.)Less
	Amaranthus viridis	*Mentha pulegium* L.
	Bonnaya brachiate	*Merremia emarginata*
	Capsella bursa-pastoris Medik	*Micromeria biflora*
	Cassia italica (Mill.) Spreng.	*Mukia maderaspatana*
	Centella asiatica	*Myriogyne minuta* (G.Forst.) Less.
	Cerasus avium	*Ocimum basilicum*
	Ceterach aureum Buch.	*Ocimum tenuiflorum*
	Coccinia indica Wight & Arn.	*Oldenlandia herbacea*
	Costus spicatus (Jacq.) Sw.	*Origanum majorana* L.
	Citrullus colocynthis (L.) Shrad.	*Orthosiphon grandiflorus* Bold.
	Dendrophthoe falcata (L.f.) Ettingsh.	*Orthosiphon stamineus* Benth
	Desmodium microphyllum (Thumb.) DC	*Parmelia perlata*
	Desmodium styracifolium(Osbeck) Merr.	Pedalium murex L.
	Didymocarpus tomentosus Wight	Pergularia daemia
	Duchesnea indica (Jacks.) Focke.	*Phyllanthus fraternus* G.L. Webster

S.No.	Class (Root)	Antiurolithiatic plants
	Echinops echinattus Roxb.	*Phyllanthus niruri*
	Ehydra fluctuans Lour.	*Phyllanthus urinaria*
	Enhydra fluctuans Lour.	*Pistacia lentiscus*
	Erigeron karvinskianus DC.	*Plantago coronopus*
	Equisetum arvense	*Polygonum aviculare*
	Equisetum bogotense	*Pratia nummularia* (Lam.) A.Braun & Asch.
	Equisetum debile	*Primula veris* L.
	Euphorbia hirta .	*Rubia cordifolia* L.
	Euphorbia prostrata Aiton	*Solanum nigrum* L.
	Euphorbia serpens Kunth.	*Sphaeranthus indicus* L.
	Forsskaolea angustifolia Retz.	*Teucrium chamaedrys* L.
	Fragaria nilgerrensis	*Teucrium scordium* L.
	Fumaria officinalis L.	*Withania somnifera* (L.) Dunal.

Table 3. Animal source with antiurolithiatic and diurtic activity

S.No.	Name	Parts used
1.	Burnt Scorpion	Whole part
2.	Sparrow	Brain
3.	Purified Earth worm	Whole part
4.	Burnt rabbit	Whole part

Table 4. Marine source with antiurolithiatic and diuretic activity

S.No.	Chemical constituent	Type of organism	Reference
1.	Chitosan (chitin) biopolymer	Marine and terrestrial organisms Macroalgae, microalgae	Moacir Fernandes Queiroz et al., [19]
2.	Fucoxanthine (active) carotenoid	Macroalgae, microalgae	Rulin Wang et al., [20]
3.	C-Phycocyanin	Spirulina plantensis(blue-green algae)	DéboraPez Jaeschke et al.., [21]

4.4 Microbial Source

Oxalate degrading bacteria such as Bifidobacterium species, bacillus species, oxalobacter formigenes, porphyromonas gingivalis, bacillus subtilis and Lactobacillus plantarum show antiurolithiatic activity by degrading oxalate crystals [22].

Table 5. Mineral source with lithiolytic and diuretic activity

S.No.	Name
1.	Alum
2.	Burnt crystal
3.	Fish stones
4.	Lapis Judaic us / Jews Stone
5.	Potassium carbonate
6.	Potassium nitrate

4.5 Mineral Source

The mineral source with diuretic and lithiolytic activity are listed in Table 5 [1].

5. CONCLUSION

Urolithiasis is outstanding considerable malady of the urogenital system and also a great origin of morbidness [23-43]. With its several aetiolognoun and high incidence of re occurrence, renal tract stone malady come up with a medical dispute [44-51].

Despite of many traditional curatives feasible for the urolithiasis, but re occurrence of stone formation still remains as a problem still to date there is no standard drug available and foremost disadvantage in the maturing of a standard drug may be the multifactorial kind of the disease and several chemical varieties of renal stones.

Many curatives has been serviced during the ages to cure renal stones. In the classic system of medicine, utmost of the therapies was taken from plants and they were proven to be useful though the rationale at the rear of their used is not Triumphant through systematic pharmacological and clinical studies apart from some compounded herbaceous medicines and plants. Herbal medicines contain several

phytonutrients and exert their beneficial outcomes by various mechanisms in treatment of urolithiasis.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

It is not applicable

ETHICAL APPROVAL

It is not applicable

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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