



E-ISSN: 2278-4136  
P-ISSN: 2349-8234  
JPP 2017; 6(3): 592-596  
Received: 03-03-2017  
Accepted: 04-04-2017

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## Antiuro lithiatic plants of family Fabaceae: A memoir of mechanism of action, therapeutic spectrum, formulations with doses

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#### Abstract

Urolithiasis is a common problem afflicted for many centuries with high recurrence. This review covers the sixty four (64) antiuro lithiatic plants of family Fabaceae used in 18 different countries with their historical antiuro lithiatic background. Hopefully, this review will not only be useful for the general public but also attract the scientific world for antiuro lithiatic drug discovery.

**Keywords:** Urolithiasis, antiuro lithiatic, natural products, drug development, Fabaceae

#### Introduction

Urolithiasis is a common problem afflicted for many centuries with high recurrence. This review covers the medicinal plants of family Fabaceae. It covers sixty four plants used in 18 different countries such as Algeria, Bosnia Herzegovina, Haiti, India, Iran, Israel, Java, Jordan, Malaysia, Morocco, Nepal, Pakistan, Palestine, Peru, Spain, Trinidad, Turkey and Yemen. Their historical antiuro lithiatic background shared in well-known books of Dioscorides, Pliny the Elder, Al Razi and Ibn Sina. In this regard, 8 Fabaceous plants were shared by Dioscorides, 4 by Ibn Sina, 3 by Pliny the Elder and 1 by Al Razi. Among the plant parts leaves, roots and seeds were noted the most common (19-22%) followed by whole plant (10%), aerial parts (8%), bark (7%) and flowers and fruits (5%). In terms of preparation, decoction was observed most common (69%), followed by infusion (20%), juices (8%) and gums (2%). The route of administration is oral in all cases. Hopefully, this review will not only be useful for the general public but also attract the scientific world for antiuro lithiatic drug discovery.

#### Abbreviations Used

h.= hour.  
OD= once daily.  
QID = four times a day.  
tbsp.= table spoon.  
TID= three times a day.  
tsp.= tea spoon.  
Days= days required to dissolve / expel kidney stones.  
Before breakfast= every morning in empty stomach.  
Whewellite: calcium oxalate monohydrate  
Brushite: calcium hydrogen phosphate dihydrate  
Struvite: magnesium ammonium phosphate

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**Table 1:** Antirolithiatic plants of family Fabaceae.

Plants	Explanations
<i>Agrimonia eupatoria</i> L.	Seeds --- India <sup>[1]</sup> .
	Pharmacological activities: Antioxidant, astringent, diuretic <sup>[1]</sup> .
	Antirolithiatic spectrum (reported): Seeds against whewellite <sup>[2]</sup> .
<i>Abrus precatorious</i> L.	Leaves juice --- India <sup>[3]</sup> .
	India: 3 - 4 tbsp. leaves juice in empty stomach daily early in the morning for 15 days <sup>[4]</sup> .
	Pharmacological activities: Analgesic, anti-inflammatory, antioxidant, astringent, diuretic, lithotriptic <sup>[1]</sup> .
<i>Acacia Jacquemontii</i> Benth.	Leaves infusion --- Pakistan <sup>[3]</sup> .
<i>Acacia modesta</i> Wall.	Whole plant --- Pakistan <sup>[5]</sup> .
<i>Acacia senegal</i> (L.) Willd.	Gum --- Palestine <sup>[6]</sup> .
<i>Acacia tortilis</i> (Forssk.) Hayne subsp. <i>raddiana</i> (Savi) Brenan.	Palestine: 20 g of gum with 250 ml of milk BD <sup>[6]</sup> .
	Fruit decoction --- Morocco <sup>[3]</sup> .
<i>Alhagi camelorum</i> Fisch.	Antirolithiatic spectrum (reported): Bark against brushite and struvite <sup>[7]</sup> .
<i>Alhagi mannifera</i> Jaub. & Spach.	Aerial parts --- Iran <sup>[8]</sup> .
	Root decoction --- India <sup>[9]</sup> .
	Pharmacological activities: Litholytic <sup>[1]</sup> , lithotriptic <sup>[10]</sup> .
<i>Alhagi maurorum</i> Medik. OR <i>Alhagi camelorum</i> DC.	Aerial parts decoction --- Iran <sup>[11]</sup> ; roots decoction --- Jordan, Palestine <sup>[3]</sup> .
	Jordan: Boil 100 g of root in one L of water. 250 ml TID till stone expulsion <sup>[4]</sup> .
	Pharmacological activities: Analgesic, anti-inflammatory, antioxidant, litholytic <sup>[1]</sup> .
<i>Alhagi persarum</i> Boiss. & Buhse.	Aerial parts --- Iran <sup>[8]</sup> .
<i>Astracantha gummifera</i> (Labill.) Podlech.	Gum --- Palestine <sup>[6]</sup> .
	Palestine: 50 g of gum with 250ml of water BD <sup>[6]</sup> .
<i>Astragalus boeticus</i> L.	Dioscorides ( <i>De Materia Medica</i> ): Whole plant is diuretic <sup>[12]</sup> .
<i>Astragalus gummifera</i> Labill.	Dioscorides ( <i>De Materia Medica</i> ): Resin is diuretic <sup>[12]</sup> .
	Pliny the Elder ( <i>Naturalis Historis</i> ): Resin is diuretic <sup>[12]</sup> .
<i>Astragalus hamosus</i> L.	Fruit decoction --- Iran <sup>[3]</sup> .
	Pharmacological activities: Analgesic, anti-inflammatory, antioxidant <sup>[1]</sup> .
<i>Bauhinia forficata</i> Link.	Leaves decoction --- India <sup>[3]</sup> .
	Pharmacological activities: Antioxidant <sup>[1]</sup> .
<i>Bauhinia purpurea</i> L.	Bark infusion --- India <sup>[3]</sup> .
	Pharmacological activities: Analgesic, anti-inflammatory <sup>[1]</sup> .
<i>Butea monosperma</i> (Lam.) Taub.	Leaves decoction, seeds powder, stem bark paste --- India <sup>[3]</sup> .
	India: Mix 1 tsp. of seed powder with 250ml of water. 250 ml OD after meals till stone expulsion <sup>[4]</sup> .
	Pharmacological activities: Anti-inflammatory, antioxidant <sup>[1]</sup> .
<i>Cassia italica</i> (Mill.) Spreng. / <i>Senna italica</i>	Antirolithiatic spectrum (reported): Seeds against whewellite <sup>[7]</sup> .
	Plant decoction --- Pakistan <sup>[3]</sup> .
<i>Caesalpinia nuga</i> (L.) Aiton.	Pharmacological activities: Analgesic, anti-inflammatory <sup>[1]</sup> .
	Root decoction --- India <sup>[9]</sup> .
<i>Caesalpinia pulcherrima</i> (L.) Sw.	Pharmacological activities: Diuretic, litholytic <sup>[1]</sup> .
	Leaves decoction --- Peru <sup>[3]</sup> .
<i>Cassia occidentalis</i> L.	Latin America: 250 g of leaves in one L of water, boil for 20 mins, keep cover for 30 mins then filter. 250 ml TID till stone expulsion <sup>[4]</sup> .
	Flowers --- India <sup>[3]</sup> .
<i>Cassia senna</i> L.	Pharmacological activities: Analgesic, anti-inflammatory, antioxidant <sup>[1]</sup> .
<i>Ceratonis siliqua</i> L.	Bark, leaves --- India, Malaysia <sup>[13]</sup> .
<i>Cicer arietinum</i> L.	Pliny the Elder ( <i>Naturalis Historis</i> ): Whole plant is diuretic <sup>[12]</sup> .
	Dioscorides ( <i>De Materia Medica</i> ): Fruits are diuretic <sup>[12]</sup>
	Pliny the Elder ( <i>Naturalis Historis</i> ): Fruits are diuretic <sup>[12]</sup>
	Al Razi / Rhazes (Al-Hawi fi al-Tibb): Fruits infusion is litholytic <sup>[12]</sup> ; Ibn Sina (Al Qanoon Fit Tibb): Fruits are diuretic and litholytic <sup>[14]</sup> .
<i>Clitoria ternatea</i> L.	Fruit infusion --- Iran <sup>[3]</sup> .
	Pharmacological activities: Analgesic, anti-inflammatory, antioxidant, diuretic, litholytic <sup>[1]</sup> .
<i>Crotalaria albida</i> Roth.	Root bark decoction --- India <sup>[3]</sup> .
	Pharmacological activities: Analgesic, anti-inflammatory, antioxidant, litholytic <sup>[1]</sup> .
<i>Crotalaria burhia</i> Buch.-Ham.	Antirolithiatic spectrum (reported): Roots against whewellite <sup>[15]</sup> .
<i>Crotalaria pallida</i> Aiton.	Root decoction --- India <sup>[3]</sup> .
	Pharmacological activities: Analgesic, anti-inflammatory, antioxidant <sup>[1]</sup> .
<i>Crotalaria sessiliflora</i> L.	Leaves decoction --- Peru <sup>[3]</sup> .
	Pharmacological activities: Anti-inflammatory, antioxidant <sup>[1]</sup> .
<i>Faba vulgaris</i> Moenchris.	Pharmacological activities: Anti-inflammatory, antioxidant <sup>[1]</sup> .
<i>Flemingia strobilifera</i> (L.) W.T. Aiton.	Leaves / seeds --- Iran <sup>[8]</sup> .
<i>Desmodium microphyllum</i> (Thunb.) DC.	Whole plant decoction --- Trinidad <sup>[16]</sup> .
<i>Desmodium styracifolium</i> (Osbeck) Merr.	Whole plant decoction --- India <sup>[3]</sup> .
	Plant decoction --- Canada, China <sup>[4,17]</sup> .
	Canada: 2-3 tsp. dried herb in 8 oz. hot water, cover and keep for 40 mins. 250 ml BD till

	stone expulsion <sup>[4]</sup> .
	China: 1 kg of dried herb in 5 L of water, boil and filter <sup>[17]</sup> .
	Pharmacological activities: Litholytic <sup>[18]</sup> , lithotriptic <sup>[10]</sup> .
	Antirolithiatic spectrum (reported): Whole plant against whewellite <sup>[19]</sup> .
<i>Dalbergia sissoo</i> DC.	Heart wood powder / decoction --- India <sup>[17]</sup> .
	India: Boil 10 - 20 g of heart wood in one L of water. 250 ml BD till stone expulsion. OR Mix 5 – 10 g of heart wood powder in 100 ml water. 100 ml BD till stone expulsion <sup>[17]</sup> .
<i>Dichrostachys cinerea</i> (L.) Wight & Arn.	Roots --- India <sup>[20]</sup> .
	Pharmacological activities: Anti-inflammatory <sup>[20]</sup> , litholytic <sup>[21]</sup> .
	Antirolithiatic spectrum (reported): Roots against whewellite <sup>[20]</sup> .
<i>Genista januensis</i> Viv.	Flowers decoction --- Turkey <sup>[22]</sup> .
<i>Glycine max</i> (L.) Merr.	Seeds decoction --- India <sup>[23]</sup> .
	India: 250 ml of seeds decoction QID for 1 month <sup>[23]</sup> .
<i>Glycyrrhiza glabra</i> L.	Roots decoction / infusion --- Algeria <sup>[24]</sup> , India, Turkey <sup>[3]</sup> .
	Pharmacological activities: Analgesic, anti-inflammatory, antioxidant <sup>[11]</sup> .
<i>Indigofera tinctoria</i> L.	Roots decoction --- India <sup>[3]</sup> .
	Pharmacological activities: Anti-inflammatory, antioxidant <sup>[1]</sup> , lithotriptic <sup>[10]</sup> .
	Antirolithiatic spectrum (reported): Roots against whewellite <sup>[25]</sup> .
<i>Laburnum anagyroides</i> Medik.	Dioscorides ( <i>De Materia Medica</i> ): Whole plant is diuretic <sup>[12]</sup> .
<i>Lupinus albus</i> L.	Seeds infusion --- Jordan <sup>[3]</sup> .
<i>Lupinus pilosus</i> L.	Roasted seeds grinded and boiled as coffee orally taken --- Turkey <sup>[22]</sup> .
<i>Lupinus varius</i> "L., p.p."	Seed infusion --- Israel <sup>[26]</sup> , Palestine <sup>[3]</sup> .
	Israel: Soak 200 g of seeds in 500 ml water for 24 h. 50 ml BD till stone expulsion <sup>[4]</sup> .
	Pharmacological activities: Litholytic <sup>[1]</sup> .
<i>Macrotyloma uniflorum</i> (Lam.) Verdc. (formerly as <i>Dolichos biflorus</i> L.)	Dioscorides ( <i>De Materia Medica</i> ): Seeds are diuretic <sup>[12]</sup>
	Ibn Sina ( <i>Al Qanoon Fit Tibb</i> ): Seeds are litholytic <sup>[12]</sup> .
	Seeds decoction / infusion --- Jordan, India, Iran, Nepal, Pakistan <sup>[3]</sup> .
	India: Decoction of 2 – 4 g seed powder. 14-28ml OD till stone expulsion. OR decoction of 2-5 g seed powder in 100 ml of water. 100 ml BD for 30 days <sup>[4]</sup> .
	Pharmacological activities: Astringent, diuretic, litholytic <sup>[1]</sup> , lithotriptic <sup>[10]</sup> .
	Antirolithiatic spectrum (reported): Seeds against Whewellite <sup>[7]</sup> , brushite and urate <sup>[27]</sup> .
<i>Medicago sativa</i> L.	Ibn Sina ( <i>Al Qanoon Fit Tibb</i> ): Roots are litholytic and expel stones <sup>[12]</sup> .
	Roots decoction --- Iran <sup>[3]</sup> .
	Pharmacological activities: Antioxidant <sup>[1]</sup> .
<i>Melilotus officinalis</i> (L.) Pall.	Aerial parts decoction --- Turkey <sup>[3]</sup> .
	Pharmacological activities: Antioxidant, diuretic <sup>[1]</sup> .
<i>Mimosa invisa</i> Colla.	Roots infusion --- India <sup>[28]</sup> .
<i>Mimosa pudica</i> L.	Leaves juice / roots decoction --- India <sup>[1]</sup> ; roots decoction --- Trinidad <sup>[16]</sup> .
	India: 50 – 100 ml of root decoction OD till stone expulsion <sup>[4]</sup> ; OR root juice BD for 2 weeks <sup>[29]</sup> .
	Pharmacological activities: Analgesic, anti-inflammatory, antioxidant, diuretic, litholytic <sup>[1]</sup> and lithotriptic <sup>[10]</sup> .
	Antirolithiatic spectrum (reported): Whole plant against brushite and whewellite <sup>[7]</sup> .
<i>Mucuna pruriens</i> (L.) DC.	Whole plant --- India <sup>[30]</sup> .
	Pharmacological activities: Lithotriptic <sup>[30]</sup> .
	Antirolithiatic spectrum (reported): Whole plant against whewellite <sup>[7]</sup> .
<i>Ononis antiquorum</i> L.	Dioscorides ( <i>De Materia Medica</i> ): Whole plant is diuretic and litholytic <sup>[12]</sup> .
<i>Ononis spinosa</i> L. subsp. <i>leiosperma</i> (Boiss.) Sirj.	Aerial parts decoction --- Iran <sup>[8]</sup> , Turkey <sup>[22]</sup>
	Roots decoction / infusion --- Bulgaria, Italy, Turkey <sup>[3]</sup> .
	Pharmacological activities: Analgesic, anti-inflammatory, antioxidant, diuretic, lithotriptic <sup>[11]</sup> .
<i>Phaseolus vulgaris</i> L.	Seeds decoction / infusion --- Haiti <sup>[3]</sup> .
	Latin America: 100 g seeds OD till stone expulsion <sup>[4]</sup> .
	Pharmacological activities: Diuretic <sup>[1]</sup> .
	Antirolithiatic spectrum (reported): Seeds against whewellite <sup>[31]</sup> .
<i>Prosopis farcta</i> (Sol. Ex Russell) J. F. Macbr.	Foliage decoction --- Palestine <sup>[3]</sup> .
	Israel: Boil 50 g of aerial parts in one L of water. 150 ml TID till stone expulsion <sup>[4]</sup> .
	Pharmacological activities: Anti-inflammatory, litholytic <sup>[1]</sup> .
<i>Pongamia pinnata</i> (L.) Pierre.	Seeds --- India <sup>[4]</sup> .
	India: Mix 25 g seed powder with 50 ml cow milk. 50 ml OD for 20 days <sup>[4]</sup> .
<i>Saraca asoca</i> (Roxb.) Willd.	Bark / seed decoction --- India <sup>[3]</sup> .
	Pharmacological activities: Bark possess antioxidant <sup>[32]</sup> ; bark and seeds have analgesic, anti-inflammatory; roots possess lithotriptic and litholytic properties <sup>[33]</sup> .
<i>Senna bacillaris</i> (L.f.) H.S. Irwin & Barneby.	Leaves and stem decoction --- Trinidad <sup>[16]</sup> .
<i>Sesbania bispinosa</i> (Jacq.) W. Wight.	Leaves and roots --- India <sup>[34]</sup>
	India: Root powder 3–6 g mixed with sugar solution in water is taken <sup>[17]</sup> .
	Pharmacological activities: Roots possess antioxidant and leaves have lithotriptic properties <sup>[34]</sup> .
	Antirolithiatic spectrum (reported): Leaves against whewellite <sup>[34]</sup> .
<i>Smithia sensitiva</i> Aiton.	Whole plant decoction --- Java <sup>[35]</sup> .
<i>Tamarindus indica</i> L.	Fruit / leaves decoction --- India <sup>[3,4]</sup> .

	India: Boil 20 g of leaves in one L of water. 250 ml OD for 7 days. OR boil dry exocarp of the pod in one L of water and filter. 250 ml BD till stone expulsion. OR 250 g of leaves in one L of water. 250 ml with sugar candy for 15 days [4].
	Pharmacological activities: Analgesic, antioxidant, astringent, litholytic [1] leaves: lithotriptic [10].
	Antiuro lithiatic spectrum (reported): Fruits against brushite [7].
<i>Teline microphylla</i> (DC.) P.E.Gibbs & Dingwall.	Flower infusion --- Spain [36].
	Pharmacological activities: Diuretic, litholytic [1].
	Leaves decoction and root juice --- India [3].
<i>Tephrosia purpurea</i> (L.) Pers.	India: Mix 1 g root powder in 100 ml water. 100 ml BD till stone expulsion. OR 250 ml of leaves decoction before breakfast till stone expulsion [4].
	Antiuro lithiatic spectrum (reported): Roots against whewellite [37].
	Ibn Sina ( <i>Al Qanoon Fit Tibb</i> ): Fruits are litholytic and expel stones [12].
	Seeds decoction / infusion --- India, Jordan, Yemen [3, 4, 38]; Fruit infusion --- Iran [3].
<i>Trigonella foenum - graecum</i> L.	India: 1 -2 tsp. dried seed in 10 oz. water, boil for 15-20 mins, cover and keep for 30 mins then filter. 4-6 oz. TID till stone expulsion [4].
	Pharmacological activities: analgesic, anti-inflammatory, antioxidant, diuretic [1], lithotriptic [39].
	Antiuro lithiatic spectrum (reported): Seeds against whewellite [40].
<i>Vicia ervilia</i> (L.) Willd.	Dioscorides ( <i>De Materia Medica</i> ): Diuretic and used against dysuria [12].
	Dioscorides ( <i>De Materia Medica</i> ): Seeds are diuretic [12].
<i>Vigna unguiculata</i> (L.) Walp.	Seed decoction --- India [4].
	India: Boil 12 g of seed powder in one L of water, cover for 30 mins. 100 ml of seed decoction BD for 30 days [4, 17].

## References

- Ahmed S, Hasan MM, Mahmood ZA. Antiuro lithiatic plants: Multidimensional pharmacology. *Journal of Pharmacognosy and Phytochemistry*. 2016; 5(2):4-24.
- Al-Snafi. Medicinal plants with anti-uro lithiatic effects (part 1). *International Journal of Pharmacy*. 2015; 5(2):98-103.
- Ahmed S, Hasan MM, Mahmood ZA. Antiuro lithiatic plants in different countries and cultures. *Journal of Pharmacognosy and Phytochemistry*. 2016; 5(1):102-115.
- Ahmed S, Hasan MM, Mahmood ZA. Antiuro lithiatic plants: Formulations used in different countries and cultures. *Pakistan Journal of Pharmaceutical Sciences*. 2016; 29(6):2129-2139.
- Mussarat S, Abd El-Salam NM, Tariq A, Wazir SM, Ullah R, Adnan M. Use of Ethnomedicinal Plants by the People Living around Indus River. *Evidence-Based Complementary and Alternative Medicine*. 2014; 14.
- Jaradat NA, Zaid AN, Al-Ramahi R, Alqub MA, Hussein F, Hamdan Z, Mustafa M, Qneibi M, Ali I. Ethnopharmacological survey of medicinal plants practiced by traditional healers and herbalists for treatment of some urological diseases in the West Bank/Palestine. *BMC Complementary and Alternative Medicine*. 2017; 17:255.
- Ahmed S, Hasan MM, Mahmood ZA. *In vitro* urolithiasis models: An evaluation of prophylactic management against kidney stones. *Journal of Pharmacognosy and Phytochemistry*. 2016; 5(3):28-35.
- Mohsenzadeh A, Ahmadipour S, Ahmadipour S, Eftekhari Z. A review of medicinal herbs affects the kidney and bladder stones of children and adults in traditional medicine and ethno-botany of Iran. *Der Pharmacia Lettre*. 2015; 7(12):279-284.
- Alok S, Jain SK, Verma A, Kumar M, Sabharwal M. Pathophysiology of kidney, gallbladder and urinary stones treatment with herbal and allopathic medicine: A review. *Asian Pacific Journal of Tropical Disease*. 2013; 3(6):496-504.
- Chanchal DK, Niranjana P, Alok S, Kulshreshtha S, Dongray A, Dwivedi S. A brief review on medicinal plant and screening method of antilithiatic activity. *International Journal of Pharmacognosy*. 2016; 3(1):1-9.
- Bahmani M, Baharvand-Ahmadi B, Tajeddini P, Rafieian-Kopaei M, Naghdi N. Identification of medicinal plants for the treatment of kidney and urinary stones. *Journal of Renal Injury Prevention*. 2016; 5(3):129-133.
- Ahmed S, Hasan MM, Mahmood ZA. Urolithiasis management and treatment: Exploring historical vistas of Greco-arabic contribution. *Journal of Pharmacognosy and Phytochemistry*. 2016; 5(5):167-178.
- Madaleno IM. Traditional medicinal knowledge in India and Malaysia. *Pharmacognosy Communications*. 2015; 5(2):116-129.
- Atayoglu T, Buchholz N. Anti-stones formulae in traditional medicine. *European Urology Today*. 2014; 6.
- Quazi S, Rathore P, Sharma A, Sharma P, Panchariya N, Sharma S. Inhibition of calcium oxalate crystallization in-vitro by *Clitoria ternatea* root. *Indian Journal of Drugs*. 2014; 2(1):24-25.
- Clement Y, Baksh-Comeau Y, Seaforth C. An ethnobotanical survey of medicinal plants in Trinidad. *Journal of Ethnobiology and Ethnomedicine*. 2015; 11(1):67.
- Kasote DM, Jagtap SD, Thapa D, Khyade MS, Russell WR. Herbasl remedies for urinary stones used in India and China: A review. *Journal of Ethnopharmacology*. 2017; 203:55-68.
- Xiang S, Zhou J, Li J, Wang Q, Zhang Q, Zhao Z, Zhang L, Chen Z, Wang S. Antilithic effects of extracts from different polarity fractions of *Desmodium styracifolium* on experimentally induced urolithiasis in rats. *Urolithiasis*. 2015; 43(5):433-9.
- Hirayama H, Wang Z, Nishi K, Ogawa A, Ishimatu T, Ueda S, Kubo T, Nohara T. Effect of *Desmodium styracifolium*-triterpenoid on calcium oxalate renal stones. *British Journal of Urology*. 1993; 71(2):143-147.
- Jayakumari S, Anbu J, Ravichandran V. Antiuro lithiatic activity of *Dichrostachys cinerea* (L.) Wight & Arn root extract. *Journal of Pharmacy Research*. 2011; 4(4):1206-1208.
- Joy JM, Prathyusha S, Mohanalakshmi S, Kumar AP, Kumar

- CK. Potent herbal wealth with litholytic activity: a review. *International Journal of Innovative Drug Discovery*. 2012; 2(2):66-75.
22. Güzel Y, Güzelşemme M, Miski M, Ethnobotany of medicinal plants used in Antakya: a multicultural district in Hatay Province of Turkey. *Journal of Ethnopharmacology*. 2015; 174:118-152.
  23. Phondani PC, Maikhuri RK, Rawat LS, Farooquee NA, Kala CP, Vishvakarma SCR, Rao KS, Saxena KG. Ethnobotanical uses of plants among the Bhotiya tribal communities of Niti Valley in Central Himalaya, India. *Ethnobotany Research and Applications*. 2010; 8:233-244.
  24. Sekkoum K, Cheriti A, Taleb S. Traditional phytotherapy for urinary diseases in Bechar district (south west of Algeria). *Electron Journal of Environmental, Agricultural and Food Chemistry*. 2011; 10(8):2616-2622.
  25. Velmurugan C, Berekete AK, Kebede EM, Bharath C, Thejasri KS. Anti-urolithiatic activity of *Indigofera tinctoria* by ethylene glycol induced model. *International Journal of Pharmacy and Pharmaceutical Research*. 2016; 7(2):359-369.
  26. Said O, Khalil K, Fulder S, Azaizeh H. Ethnopharmacological survey of medicinal herbs in Israel, the Golan Heights and the West Bank region. *Journal of Ethnopharmacology*. 2002; 83(3):251-265.
  27. Ahmed S, Hasan MM, Mahmood ZA. *Macrotyloma uniflorum* (Lam.) Verdc. (Papilionaceae): a review of medicinal uses, phytochemistry and pharmacology. *World Journal of Pharmacy and Pharmaceutical Sciences*. 2016; 5(2):51-62.
  28. Rai PK, Lalramnghinglova H. Ethnomedicinal plants of India with special reference to an Indo-Burma hotspot region: An overview. *Ethnobotany Research and Applications*. 2011; 9:379-420.
  29. Kumar SP, Latheef A, A. Remashree. Ethnobotanical survey of diuretic and antilithiatic medicinal plants used by the traditional practitioners of Palakkad District. *International Journal of Herbal Medicine*. 2014; 2(2):52-56.
  30. Vamsi S, Raviteja M, Kumar GS. *In-vitro* antiurolithiatic potential of various extracts of *Mucuna pruriens*. *International Journal of Pharmaceutical Sciences and Research*. 2014; 5(9):3897-3902.
  31. Ahmed S, Hasan MM, Mahmood ZA. *Macrotyloma uniflorum* (Lam.) Verdc, *Phaseolus lunatus* Linn, *Phaseolus vulgaris* Linn. seeds: Nature's potential candidates against urolithiasis by virtue of multidimensional pharmacology. *World Journal of Pharmacy and Pharmaceutical Sciences*. 2016; 5(8):289-300.
  32. Yadav NK, Saini KS, Hossain Z, Omer A, Sharma C, Gayen JR, Singh P, Arya KR, Singh RK. *Saraca indica* bark extract shows in vitro antioxidant, antibreast cancer activity and does not exhibit toxicological effects. *Oxidative Medicine and Cellular Longevity*. 2015; 15.
  33. Singh S, Krishna ATH, Kamalraj S, Kuriakose GC, Valayil JM, Jayabaskaran C. Phytomedicinal importance of *Saraca asoca* (Ashoka): an exciting past, an emerging present and a promising future. *Current Science*. 2015; 109(10):1790-1801.
  34. Doddola S, Pasupulati H, Koganti B, Prasad KVSRG. Evaluation of *Sesbania grandiflora* for antiurolithiatic and antioxidant properties. *Journal of Natural Medicines*. 2008; 62(3):300-307.
  35. Lemmens R, Bunyapraphatsara N. *Plant Resources of South-East Asia, No 12: Medicinal and poisonous plants*. 2003; Leiden: Backhuys Publishers.
  36. Darias V, Martin-Herrera D, Abdala S, De la Fuente D. Plants used in urinary pathologies in the Canary Islands. *Pharmaceutical Biology*. 2001; 39(3):170-180.
  37. Shukla A, Mourya P. Investigations for anti-urolithiatic activity of roots against *Tephrosia purpurea* ethylene glycol-induced renal calculi in rats. *Asian Journal of Pharmacy and Pharmacology*. 2016; 2(2):40-43.
  38. Abu-Irmaileh BE, Afifi FU. Herbal medicine in Jordan with special emphasis on commonly used herbs. *Journal of Ethnopharmacology*. 2003; 89(2):193-197.
  39. Laroubi A, Touhami M, Farouk L, Zrara I, Aboufatima R, Benharref A, Chait A. Prophylaxis effect of *Trigonella foenum graecum* L. seeds on renal stone formation in rats. *Phytotherapy Research*. 2007; 21(10):921-5.
  40. Shekha MS, Qadir AB, Ali HH, Selim XE. Effect of Fenugreek (*Trigonella foenum-graecum*) on ethylene glycol induced kidney stone in rats. *Jordan Journal of Biological Sciences*. 2014; 7(4):257-260.