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A COMPREHENSIVE GLIMPSE ON GLOBALLY USED ANTIUROLITHIATIC PLANTS OF CONVOLVULACEAE, COSTACEAE, EBENACEAE, FAGACEAE, HYPERICACEAE, LAURACEAE, LILIACEAE AND LYTHRACEAE

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ABSTRACT

Urolithiasis is a common worldwide problem with high recurrence. This review covers Convolvulaceae seven (07), Costaceae four (04), Ebenaceae four (04), Fagaceae six (06), Hypericaceae eight (08), Lauraceae nine (09), Liliaceae twelve (12) and Lythraceae three (03) plants used globally in different countries. Hopefully, this review will not only be useful for the general public but also attract the scientific world for antiurolithiatic drug discovery.

KEYWORDS: Urolithiasis, antiurolithiatic, natural products, drug development.

INTRODUCTION

Urolithiasis is a common worldwide problem with high recurrence. Medicinal plants have been used globally in different countries and cultures for its prophylactic management and treatment. Current attempt is one of the parts of the study entitled "Searching globally (orally) used antiurolithiatic plants belonging to different plant families". The plants of the family Asteraceae[1], Apiaceae[2], Fabaceae[3] and Lamiaceae[4] have already been discussed in a similar way. The presented review article covered Convolvulaceae, Costaceae, Ebenaceae, Fagaceae, Hypericaceae, Lauraceae, Liliaceae and Lythraceae families in this regard.

Convolvulaceae

It covers the seven (07) plants used in India, and Trinidad. Among the plant parts leaves were noted the most common (50 %) followed by whole plant, fruits, flowers, stem and roots (10% each). In terms of preparation, the decoction and infusions were observed more commonly (40% each), followed by extracts (20%).

Costaceae

This review covers the four (04) plants of the family Costaceae used in Brazil and India. Among the plant parts roots were noted the most common (60%) followed by whole plant, and tubers (20% each). In terms of preparation, the decoction was observed more commonly (50%), followed by juices and infusions (25% each).

Ebenaceae

Four (04) medicinal plants (aerial parts) were found to use in India and Iran. In terms of preparation, the decoction was observed more commonly (62.5%), followed by infusion (37.5%).

Fagaceae

This review covers the six (06) medicinal plants used in Algeria, Bosnia, Herzegovina and Turkey. Among the plant parts only aerial parts were noted. In terms of preparation, only infusion was observed.

Hypericaceae

This review covers the eight (08) medicinal plants of the family Hypericaceae used in Bosnia, Herzegovina, India, Palestine and Turkey. Their historical antiurolithiatic background shared in well known book of Dioscorides. Among the plant parts, aerial parts were noted the most common (42.85%) followed by whole plant and leaves (28.57% each). In terms of preparation, the decoction was observed more commonly (50 %), followed by infusions (33.33%) and extracts (16.66%).

Lauraceae

This review covers the nine (09) medicinal plants of the family Lauraceae used in America, India, Iran, Jordan and Turkey. Their historical antiurolithiatic background shared in well known books of Dioscorides, Ibn Sina and Daoud al Antaki. Among the plant parts leaves were noted the most common (55.55%) followed by bark (33.33%) and whole plant

(11.11%). In terms of preparation, decoction and infusions were observed commonly (42.85% each), followed by extracts (14.28%).

Liliaceae

This review covers the twelve (12) medicinal plants of the family Liliaceae used in Algeria, India, Iran, Israel, Mt. Pelion area of Greece, Pakistan, Palestine and Turkey. Their historical antiurolithiatic background shared in well known books of Dioscorides and Ibn Sina. Among the plant parts roots and rhizomes were noted the most common (42.85%) followed by leaves (28.57%), bulbs (21.42%) and stem (7.14%). In terms of preparation, the decoction was observed the most commonly (75%), followed by infusions (25%).

Lythraceae

This review covers the three (03) medicinal plants of the family Lythraceae used in India and Libya. Their historical antiurolithiatic background shared in well known book of Ibn Sina. Among the plant parts leaves, bark and roots were noted. In terms of preparation, decoction and juices were observed the most commonly (50% each).

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

MSUM: Mono sodium urate monohydrate

Struvite: magnesium ammonium phosphate

Table – 1: Antiurolithiatic plants of different families.

Antiurolithiatic plants	Explanation
Ebenaceae (04)	
Diospyros ebenum J. Koenig.	Wood --- Iran.[5]
	Pharmacological activities: Antioxidant.[6]
Diospyros malabarica (Desr.) Kostel.	5 – 10 g ripe fruit raw eaten OD --- India.[7]
	Antiurolithiatic spectrum (reported): Fruits against whewellite.[8]
Diospyros melanoxylon Willd.	Flowers --- India.[9]
	Pharmacological activities: Litholytic.[9]
Diospyros montana Roxb.	Bark and leaves --- India.[10]
Convolvulaceae (07)	
Argyreia nervosa (Burm.f.) Bojer.	Leaves infusion --- India.[5]
	Pharmacological activities: Analgesic, anti-inflammatory, antioxidant.[6]
Convolvulus arvensis L.	Leaves and flowers --- India.[11]
	Pharmacological activities: Lithotriptic.[11]
	Antiurolithiatic spectrum (reported): Leaves and flowers against whewellite.[11,12]
Cuscuta campestris Yunck.	Leaves / stem infusion or decoction --- Trinidad.[13]
Ipomoea eriocarpa R. Br.	Leaves --- India.[14]
	Pharmacological activities: Analgesic, antioxidant, lithotriptic.[14]
	Antiurolithiatic spectrum(reported): Leaves against struvite.[14]
Ipomoea pes-tigridis L.	Leaves chewed --- India.[15]
Merremia emarginata (Burm. f.) Hallier f.	Whole plant extract --- India.[16]
	India: 50 ml of plant extract BD for 15 days.[16]
Xenostegia tridentata (L.) D.F. Austin & Staples.	Fruit pulp or roots decoction --- India.[5,16]
	India: 1tsp. of fruit pulp powder with 250 ml coconut water. 250 ml in empty stomach till stone expulsion.[16]
	Pharmacological activities: Anti-inflammatory, diuretic.[6]
Costaceae (04)	
Costus arabicus L.	Root decoction--- Brazil.[17]
	Pharmacological activities: Litholytic, lithotriptic.[6]
	Antiurolithiatic spectrum (reported): Whole plant against whewellite.[17]
Costus igneus N.E.Br.	Roots --- India.[18]
	Pharmacological activities: Antioxidant, diuretic, litholytic.[6]
Costus speciosus (Koen.) Sm.	Crushed root juice --- India[19]; tubers decoction --- India.[5]
	Pharmacological activities: Antispasmodic, diuretic, litholytic.[6]
Costus spicatus (Jacq.) Sw.	Plant infusion --- Brazil.[5]
	Pharmacological activities: Analgesic, anti-inflammatory.[6]
Fagaceae (06)	
Quercus cerris L.	Aerial parts infusion --- Bosnia, Herzegovina.[5]
Quercus coccifera L.	Roasted and grinded oak nut (fruit) mixed with honey and taken--- Turkey.[20]
Quercus petraea (Mattuschka) Liebl.	Aerial parts infusion --- Bosnia, Herzegovina.[5]
Quercus prinus L.	Fruits --- Algeria.[21]
	Antiurolithiatic spectrum (reported): Fruits against whewellite.[21]
Quercus pubescens Willd.	Aerial parts infusion --- Bosnia, Herzegovina.[5]

Quercus robur L.	
Hypericaceae (08)	
Hypericum coris L.	Dioscorides (De Materia Medica): Seeds are diuretic.[22]
Hypericum hypericoides (L.) Crantz.	Leaves decoction --- Turkey.[23]
	Pharmacological activities: Lithotriptic.[6]
Hypericum montbretii Spach.	Plant decoction --- Turkey.[5]
Hypericum montanum L.	Aerial parts infusion --- Bosnia, Herzegovina[5]; leaves extract --- India.[7]
	Pharmacological activities: Antioxidant.[6]
Hypericum olympicum L.	Dioscorides (De Materia Medica): Diuretic and used against dysuria.[22]
Hypericum perforatum L.	Whole plant decoction --- Palestine[24]; aerial parts decoction --- Turkey[25]; aerial parts infusion --- Bosnia, Herzegovina.[5]
	Palestine: Boil 30 g of plant in 100 ml of water for 25 mins and taken TID after meals.[24]
	Pharmacological activities: Antioxidant[6], litholytic.[26]
Hypericum tetrapterum Fr.	Aerial parts infusion --- Bosnia, Herzegovina.[5]
	Pharmacological activities: Antioxidant.[6]
Hypericum triquetrifolium Turra.	Dioscorides (De Materia Medica): Diuretic.[22]
Lauraceae (09)	
Actinodaphne angustifolia (Blume) Nees.	Plant decoction --- India.[5]
Cinnamomum aromaticum Nees. / *Cinnamomum cassia* (L.) J.Presl.	Dioscorides (De Materia Medica): Bark / leaves are diuretic[22]; Ibn Sina (Al Qanoon Fit Tibb): Bark is litholytic and expels stones.[22]
	Bark infusion --- Iran[5]
Cinnamomum bejolghota (Buch-Ham) Sweet.	Bark infusion --- India.[5]
	Pharmacological activities: Antioxidant.[6]
Cinnamomum tamala L.	Dioscorides (De Materia Medica): Leaves are diuretic.[22]
	Leaves infusion --- India.[5]
	Pharmacological activities: Antioxidant.[6]
Cinnamomum verum J. Presl. / *Cinnamomum zeylanicum* Blume.	Leaves decoction --- India[5]; stem bark --- Iran[27], Jordan[28]
	India: Boil 10 g of bark and 5 g of leaves in one L of water. 20 ml BD for 10 days.[16]
	Pharmacological activities: Anti-inflammatory, antioxidant.[6]
Persea americana Mill.	Leaves decoction / infusion --- America, Turkey.[18, 20]
	Pharmacological activities: Antioxidant, diuretic[29], litholytic[6], lithotriptic.[30]
	Antiurolithiatic spectrum (reported): Fruits against brushite and whewellite[12]; leaves against whewellite.[29, 30]
Persea gratissima Gaertn. fil.	Leaves decoction --- Turkey.[5]
	Turkey: 250 ml of decoction prepared with 10-15 pieces of leaves TID.[31]
	Pharmacological activities: Diuretic.[6]
Laurus nobilis L.	Dioscorides (De Materia Medica): Bark / roots are litholytic[22]; Ibn Sina (Al Qanoon Fit Tibb): Bark / roots are litholytic[22]; Daoud al-Antaki (Tadhkirat Uli l-al-Bab wa l-Jami li-L-'Ajab al-'Ujab): Bark / roots are useful in renal stone.[32]
	Bark infusion --- Iran[5]; leaves aqueous extract --- Jordan[33]

	Pharmacological activities: Analgesic, anti-inflammatory, antioxidant.[6]
Liliaceae (12)	
Asparagus acutifolius L.	Aerial parts decoction --- Turkey[20]; leaves and roots eat as salad --- Algeria.[34]
Asparagus officinalis L.	Root powder 3 – 6 g orally taken --- India.[7]
Asparagus racemosus (Willd.) Oberm.	Ibn Sina (Al Qanoon Fit Tibb): Roots are litholytic and expel stones.[22]
	Roots decoction --- India.[5]
	Antiurolithiatic spectrum (reported): Roots against whewellite.[35]
Asphodelus aestivus Brot.	Dioscorides (De Materia Medica): Roots are diuretic[22];
	Aerial parts --- Turkey.[36]
Asphodelus tenuifolius Cav.	Dioscorides (De Materia Medica): Roots are diuretic.[22]
	Leaves decoction --- Pakistan.[5]
Drimia indica (Roxb.) Jessop. (formerly known as *Urginea indica*)	Bulb infusion --- India.[5]
Muscari neglectum Guss. ex Ten.	Plant bulbs --- Iran.[37]
Ruscus aculeatus L.	Whole plant decoction --- Mt. Pelion area of Greece[38]; rhizomes decoction --- Turkey[20]; leaves / stem decoction --- Israel, Palestine.[5,16]
	Israel: Boil 50 g stems / leaves in one L of water. 150 ml TID till stone expulsion[16]; Turkey: 125 ml of rhizome decoction BD for 7 – 8 days.[25]
Ruscus hypoglossum L.	Fruits --- Turkey.[5]
Scilla indica Roxb.	Bulbs --- India.[5]
	Pharmacological activities: Diuretic.[6]
Smilax aspera L.	Roots / leaves infusion --- Palestine[5]; roots decoction for 15 days---Turkey.[39]
Smilax lanceifolia Roxb.	Rhizome decoction --- India.[5]
Lythraceae (03)	
Ammannia baccifera L.	Pharmacological activities: Lithotriptic.[9]
	Antiurolithiatic spectrum (reported): Whole plant against brushite.[40]
Lawsonia inermis L.	Ibn Sina (Al Qanoon Fit Tibb): Roots are litholytic and expel stone.[22]
	Bark decoction --- India, Libya.[5]
	Pharmacological activities: Analgesic, anti-inflammatory, antioxidant.[6]
	Antiurolithiatic spectrum (reported): Leaves against whewellite.[41]
Rotala rotundifolia (Buch.-Ham. ex Roxb.) Koehne.	Aerial parts juice --- India.[5]

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