

**HERBAL PLANTS USED IN DIURETICS****Krishna B. Gawate* and Nirajan S. Tiwari**

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ABSTRACT

Medicinal plants are an important source of treatment for a variety of disorders, including diuretics. As diuretics, mono- and poly-herbal formulations have been employed. More than 650 mono and poly-herbal formulations in the form of decoction, tincture, pills, and capsules are estimated to be derived from more than 75 clinically used plants. A vast number of research have been conducted to support the diuretic effects of traditional herbal remedies. Herbal medicine has been the most widely administered diuretic drug. They limit electrolyte reabsorption from the nephron lumen, raising osmolarity and increasing water and electrolyte excretion. It's vital to remember that there's a fine line between dietary salt intake and sodium reduction. Diuretics improve urine flow rate and are thus employed in a number of syndromes such as hypertension, tension, cardiovascular difficulties, diabetes mellitus, and infections caused by liver degradation. When compared to allopathic treatments, these plants are fairly protected and free of toxic effects, making them a superior option for treating infections. This work may demonstrate accomplishment in the selection of medicinal plants for conveying their function on diuretics.

KEYWORDS: Medicinal plants, Moa, Uses, Types.

INTRODUCTON

A diuretic is any chemical that encourages increased urine production, often known as diuresis, which includes forced diuresis. Several types of diuretics stimulate the outflow of water from the body. Alternatively, antidiuretics such as vasopressin or antidiuretic hormone limit water excretion in the urine.^[1] The worldwide trend towards the use of natural plant medicines has produced an enormous demand for information about the medicinal plant's

qualities and uses. Ayurvedic, Siddha, and Unani medicine in India are primarily based on the utilisation of plant components. In recent years, herbal medications have grown in importance and appeal. Because of their safety, efficacy, and low cost.^[2] The health advantages of herbs and botanicals are gaining popularity. In keeping with this, a rising number of publications have been published stating that plants or plant-derived actives can operate as mild diuretics. Diuretics are drugs that work within the kidney to stimulate fluid excretion from the body.^[3] The ayurvedic medical system is widely practised and acknowledged not only in India, but also in developed countries such as the United States, Europe, China, Japan, and Canada. According to the WHO, approximately 80% of the world's population still relies on herbal medicines for primary health care. Because they have less side effects than the current medical system, there has been an increase in demand for pharmaceutical goods of natural origin all across the world.^[4] Around 120 plants have diuretic qualities, according to Ayurvedic texts. The primary issue with herbs is that they only have one operation and a few related workouts. Diuretic enhancers that accelerate water outflow can be effective in a range of illnesses, including nephritis, premenstrual syndrome, hypertension, migraine, hyperkalemia, renal dysfunction, and epilepsy.^[5]

Mao of diuretics

Diuretics are useful in the treatment of oedema and hypertension. This function mostly increases the negative net water and solute balance. By both active and passive processes, the proximal Convolute tubule reabsorbs around 50-66% of fluid. Because it is highly permeable to water but impervious to solutes, the narrow descending limb of the Loop of Henle facilitates osmotic water abstraction. The reduced water absorption from the descending limb of the Loop of Henle plays an important role in the overall improved diuresis condition. Because the thin ascending limb of the Loop of Henle is impervious to water but extremely permeable to chloride and sodium, diuretics have no impact on it.^[6]

Uses of diuretics

Treatment of nephrotic syndrome and heart failure.

Enhance salt excretion and urine

Treatment of oedema and hypertension

Reduce water retention and blood pressure

Hypercalemia and renal calcium stones

Different types of diuretics**Table no. 1**

Type	Example	Site of action	Mechanism
Carbonic anhydrase inhibitors	Acetazolamide	Proximal tubules	Inhibition of CA
Osmotic	Mannitol	Loop of Henle	Osmotic action
Loop diuretics	Furosemide	Loop of Henle	Inhibition of Na ⁺ K ⁺ 2Cl symport
Thiazides	Hydrochlorothiazide	Distil convoluted tubule	Inhibition of Na ⁺ Cl ⁻ symport
Potassium sparing diuretics 1) Na ⁺ channel inhibitors 2) Aldosterone antagonist	Triamterene, amiloride Spironolactone	Cortical collecting tubule Cortical collecting tubule	Inhibition of Na ⁺ channel Inhibition of aldosterone receptor

Some diuretics herbs

1. *Mangifera indica*

Family: Anacardiaceae

It is found in the wild in India, and cultivated forms have been brought to various warm regions of the world. It is the world's largest fruit tree, reaching a height of one hundred feet with a circumference of twelve to fourteen feet, sometimes surpassing twenty. Shree devi investigated the diuretic effect of *Mangifera indica* bark extract in rats. They test the diuretic efficacy of *Mangifera indica* extracts in ethyl acetate, ethanol, and water. The diuretic effect was tested in rats (175-200 kg body weight) by monitoring urine volume at 1, 2, 4, 6, and 24 hours. Furosemide (20mg/kg) i.p. and mannitol (100mg/kg) i.v. were used as positive controls. The extract was given orally at a dose of 250 mg/kg body weight. A diuretic investigation found that the aqueous extract had the highest Na⁺/K⁺ ratio, followed by ethanol and ethyl acetate extracts. When compared to other extracts, aqueous extracts have the best diuretic efficacy.^[2]



Fig. No. 1: *Mangifera indica*.

2. *Allium sativum*

Family: Liliaceae

Whole plant was used. In the treatment of pulmonary disorders, garlic is utilised as a carminative, expectorant, and disinfectant. Purified garlic fractions have a dose-dependent inhibitory effect on sodium-potassium ATPase. As a result, it may cause diuresis by increasing the volume of urine.^[7]



Fig. No. 2: *Allium sativum*.

3. *Rosmarinus officinalis*

Family: Labiatae

It is known as rosemary. It is used as a folk medicine to treat urinary problems. Its decoction is used in traditional medicine to treat urinary retention as a diuretic. It contains triterpenoids, volatile oil, caffeic acids, rosmarinic acids, and chlorogenic acids. Because triterpenoid and rosmarinic acids are associated with diuretic effect, the presence of these components qualifies it as a diuretic.^[8]



Fig. No. 3: *Rosmarinus officinalis*.

4. *Cissampelos pareira* linn

Family: Menispermaceae

It is a sub-erect or climbing herb known in Indian traditional medicine as ambastha or laghupatha. It is mostly encountered in Karnataka. The diuretic efficacy of 100 mg/kg and 200 mg/kg BW methanolic extract of *C. pareira* was tested in male rats, and the standard utilised was 20 mg/kg BW furosemide, which indicated considerable action.^[9]



Fig. No. 4: Cissampelos pareira linn.

5. Hibiscus sabdariffa

Family: Malvaceae

It is reported to have diuretic and antipyretic properties. The leaves were diuretic, emollient, sedative, and refrigerant. The blooms include gossypetin, glycoside hibiscin, and anthocyanin. These have diuretic effects, lowering blood viscosity and blood pressure.^[10]



Fig. No. 5: Hibiscus sabdariffa.

6. Curcumis melo

Family: Cucurbitaceae

It often known as musk melon, and is known as kharbuzah in Unani medicine. It is an annual climber or creeping herb that can be found in all districts of Karnataka. C. melo L. was found to have diuretic properties in albino rats. The ethanol extract significantly increased urine volume and chloride content. C.melo further extract [400 mg/Kg] had a greater diuretic effect than ordinary furosemide.^[1]



Fig. No. 6: Curcumis melo.

7. *Lepidium sativum*

Family: Brassicaceae

It sometimes known as Garden Cress. It is a fast growing erect glabrous annual herb found primarily in the Karnataka districts of Bangalore and Kolar. Rats were given aqueous and methanolic extracts of *L. sativum* garden grass to test their^[8] diuretic efficacy. As a positive control, hydrochlorothiazide was used. Urine volume and salt content rose after administration of both aqueous and methanolic extracts, whereas potassium excretion was raised only by the aqueous extract. The diuretic impact was comparable to that of hydrochlorothiazide, and methanol extract offers the added benefit of potassium conservation.^[11]



Fig. No. 7: *Lepidium sativum*.

8. *Achyranthes aspera* linn

Family: Amaranthaceae

Plant part used: the entire plant

The diuretic potential of a methanolic extract of the whole plant of *Achyranthes aspera* was studied. Lipschitz et al discovered the diuretic effect using furosemide as the standard medication. Diuretic action of *Achyranthes aspera* aqueous extract was reported. Diuretic

activity of aqueous and alcoholic extracts of *Achyranthes aspera* leaves was investigated in rats.^[5]



Fig. No. 8: *Achyranthes aspera* linn.

9. *Butea monosperma* lam

Family: Fabacea

Part of plant used: Flowers

Butea monosperma aqueous and alcoholic extracts Flowers were examined in rats for diuretic action. This study looked at the effect of aqueous extracts of dried seeds powder from *Butea Monosperma* and *Nigella Sativa* plants on Ethylene glycol-induced renal calculi in albino wistar rats.^[5]



Fig. No. 9: *Butea monosperma* lam.

10. *Biophytum sensitivum* Linn

Family: Oxalidaceae

Plant part used: The entire plant

In Wistar strain albino rats, the diuretic efficacy of different extracts of the whole plant of *Biophytum sensitivum* was investigated. The anti-urolithiatic effect of a standardised extract

of *Biophytum sensitivum* against zinc disc implantation-induced urolithiasis in rats was investigated.^[12]



Fig. No. 10: *Biophytum sensitivum* linn.

11. *Ammomum subutalum* roxb

Family: Zingiberaceae

Plant parts used: Seeds

Large cardamom seeds combined with melon seeds are indicated as a diuretic in cases of kidney stones and as an antidote to both snake and scorpion poison.^[13]



Fig. No. 11: *Ammomum subutalum* roxb.

12. *Carissa edulis*

Family: Apocynaceae

Plant parts used: Root bark

The diuretic efficacy of different solvent fractions of an 80% methanol extract of *Carissa edulis* root bark was studied in normal wistar rats.^[14]

Fig. No. 12: *Carissa edulis*.

Some medicinal plant's used in diuretics

Table No. 2

Sr. No.	Plant name/ family	Geographical distribution	Part used	Ayurvedic Name	Chemical constituents
1.	<i>Abutilon indicum</i> , Malvaceae	Throughout the tropical parts of India	Whole plant	Atibalaa	Mucilage, tannins, asparagines, flavonoids, saponins, sterols
2.	<i>Acacia suma</i> , Mimosaceae	West Bengal, Bihar, Western Peninsula	Wood	Shvetakhadira	Tannins, catechin phlobatannin
3.	<i>Achyranthes Bidentata</i> , Amaranthaceae	Temperate and Subtropical Himalayas from Kishtwar to Sikkim	Seeds, roots	Shveta- apaamaarg	Oligosaccharide, steroids, triterpenoids, alkaloids, coumarins
4.	<i>Aerva lanata</i> , Amaranthaceae	Tropical parts of India	Entire plant	Paashaanab- heda	Palmitic acid, alpha- amyrin, alkaloids
5.	<i>Allium sativum</i> , Liliaceae	Native to Central Asia and cultivated throughout India	Bulbs	Lashuna	Sulphur containing amino acids known as alliin
6.	<i>Terminalia arjuna</i> , Combretaceae	Throughout India	Bark, leaves	Arjuna	Arjunolic acid, terminic acid, glycosides, flavones, tannins, oligomeric proanthocyanidins
7.	<i>Azima Tetracantha</i> , Salvadoraceae	Peninsular India, Orissa, West Bengal	Roots, leaves	Mulchangan	Alkaloids-azimine, azcarpine, carpine
8.	<i>Benincasa hispida</i> ,	Cultivated largely in	Roots, leaves,	Kuushmaanda	Pentacyclic triterpene

	Cucurbitaceae	Uttar Pradesh, Punjab, Rajasthan and Bihar	fruits		
9.	<i>Boerhaavia diffusa</i> , Nyctaginaceae	Throughout India as a weed	Roots	Punarnavaa	Xanthone, flavonoids, arbinofuranoside
10.	<i>Capparis spinosa</i> , Cappariadaceae	Rajasthan, peninsular India	Bark, flower	Himsraa	Glucocapparin, sinigrin, glucocleomin, glucocapangatin
11.	<i>Daucus carota</i> , Umbellifera	Punjab, Haryana, Uttar Pradesh, and Madhya Pradesh	Roots, seeds	Gaajara	Flavonols including, quercetin, kaempferol, flavones including, apigenin, chypsin, leuteolin
12.	<i>Centella asiatica</i> , Apiaceae	Marshy places throughout	Leaves	Manduukaparni	Triterpenoids saponins, asiatic acid, Madecassoside

CONCLUSION

The purpose of this research was to provide an overview of current understanding on the use of herbs as diuretics. It should be mentioned that some therapeutic plants use diuretic movement in specific locations. Herbal medications, unlike allopathic prescriptions, have no side effects or dangers. These herbal plants are high in beneficial phytoconstituents, which can be used as a therapeutic medicine to treat hypertension patients. Because of its active therapeutic properties, safety, and efficacy, herbal medicines are in high demand in developing countries.

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