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A Review Article on Certain Indian Medicinal Plants Have Nephroprotective Ethno-Medicinal Properties

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ABSTRACT

Herbal plants may be a valuable source of potentially beneficial new compounds for developing effective therapy to address a variety of kidney disorders. While abundant herbs have been proven to work as nephroprotective agents, there is a lack of verifiable evidence to support these claims. To develop a successful herbal therapy to treat serve kidney disorders, systematic investigation of background conditions such as acute renal failure (ARF), nephritic syndrome (NHS), and chronic interinterstitial nephritis (CIN) is necessary. Herbal medicinal products acquire an alleviating background due to the presence of their chemical constituents. Many extracts of well-known articles and easily digestible antioxidants have been found to appear as nephrotoxic. On the other hand, herbal drugs have been found to have an all-encompassing nephroprotective effect due to their antioxidant and diuretic properties. This review aims to provide an overview of nephroprotective medicinal plants that have been scientifically proven in the treatment of renal disorders.

Keywords: Nephroprotective, therapy, antioxidant and anti-spasmodic.

INTRODUCTION

The demand for medicinal plants is increasing in both developing and developed countries. The field of medicinal plant research is one of the leading areas of analysis globally. However, more attention needs to be paid to bioactivity-safety evaluation and the importance of medicinal plants. Kidney failure is among the most common diseases among many accepted diseases in India.

Many plants accept been acclimated for analysis of kidney failure in acceptable arrangement of anesthetic throughout the world.

In addition to diet, plant preparation was the mainstay of pain management until the advent of allopathic medicine. Ethnically-derived plants can be used to help prevent the need for dialysis and treat the causes and

consequences of kidney failure, as well as reducing many of the negative effects of dialysis.[1] In some cases, nephrotoxicity can occur as a result of kidney disease or dysfunction that results from exposure to medicinal products, environmental substances, or industrial chemicals. Some of the factors that make the kidney susceptible to toxic injury are found in indigenous medicines.

This includes urine pH, High blood flow rate, high endothelial surface area, high metabolic activity, active uptake by tubular cell and medullary interstitial concentration.

Toxins may act directly on the tubules, at the point where adulteration is carried or concentrated, or by causing renal ischemia, hemoglobinuria or myoglobinuria. With continued recognition and acknowledgment to top doses, the severity of renal failure can be accessed.[2]

Coxosporin, Amylcoside Antibiotics, Cisplatin,Amphotericin- B, Beta-Lactam Antibiotics and Indocin are reviewed.These drugs were produced to cause nephrolithiasis because they are the most common cause of renal injury in children.Their nephrolithic effects are acquired by altered mechanisms.First, agents that may cause tubular accident tend to be ancillary to their banal effects.[3]

The goal of this review is to illustrate the discovery and development of medicine from the classical to the genomic stage, with a particular emphasis on the role and potential of medicinal plants. Ayurveda has been a valid Indian system of achieving medicine for millennia. Ethnomedicine studies are generally well-documented in absolute and locally important bulbs that breed abnormally, for the analysis of embarrassing drugs.[4-6]

IDENTIFICATION OF RESEARCH PROBLEM

Not surprisingly, kidney and urinary tract diseases rank 12th on the list of leading causes of death in the world according to the World Health Organization (WHO). Kidney failure (or chronic kidney disease) has doubled in the past 15 years. Currently, over 1 million people around the world are on dialysis or have a functioning graft. Diabetes and hypertension are major causes of kidney failure. In India, there are about 7.85 million patients suffering from chronic kidney failure. Over 600,000 of these patients will require treatment, but 90% of patients with kidney disease cannot afford it. Kidney shortage is a global problem and is worst in Asian countries. Various kidney disorders have been identified and prescribed in the Indian system of medicine known as Ayurveda. In this study, we will identify some of the plants used in Ayurveda for evaluation as neoplastic agents. [7]

MAIN METABOLIC ABNORMALITIES IN PATIENTS WITH RENAL FAILURE [8]

Anorexia – reduced oral nutrient intake

Gastrointestinal consequences of uremia

Restrictive diets

Uremic toxicity

inadequate dialysis prescription

Metabolic acidosis

Endocrine factors (PTH, insulin resistance etc.)

Peripheral insulin resistance

Impairment of lipolysis

Low grade inflammatory state activation of protein catabolism

Augmented catabolic response to inter current disease

Metabolic acidosis

Hyperparathyroidism's, uremic bone disease

Impairment of vitamin D3 activation

Table;-List of Nephroprotective Medicinal Plants

S.No	Plants Name	Family	Parts use
1.	*Adhatoda zeylanica*	Acanthaceae	Leaves
2.	*Aegle marmelos*	Rutaceaeae	Leaves
3.	*Aerva javanica*	Amaranthaceae	Fresh roots
4.	*Aerva lanata*	Amaranthaceae	Whole plant
5.	*Allium sativum L*	Amaryllidaceae	Garlic
6.	*Aloe barbadensis*	Xanthorrhoeaceae	Leaves
7.	*Avurikudineer*	Fabaceae	Roots and Leaves
8.	*Bauhinia variegate*	Caesalpiniaceae	Stems
9.	*Berberris aristata*	Berberidaceae	Root bark
10.	*Boerhaavia diffusa*	Nyctaginaceae	Leaves
11.	*Butea monosperma*	Fabaceae	Whole plant
12.	*Carica papaya*	Caricaceae	Seeds
13.	*Cassia auriculata*	Fabaceae	Root
14.	*Casuarina equisetifolia*	Casuarinaceae	Dried leaves
15.	*Cichorium intybus*	Asteraceae	Aerial Parts
16.	*Clitoria ternatea*	Papilionaceae	Whole plant
17.	*Crataeva nurvula*	Capparidaceae	Fruit
18.	*Curcuma longa*	Zingeberaceae	Rhizome
19.	*Dichrostachyscinera*	Mimosaceae	Roots
20.	*Diospyros lotus*	Ebenaceae	Seeds
21.	*Elephantophus scaber*	Asteraceae	Leaves
22.	*Emblica officinalis*	Euphorbiaceae	Fruits
23.	*Ficus religiosa*	Moraceae	Dried latex
24.	*Ficus racemose*	Moraceae	Stem bark
25.	Ginkgo biloba	Ginkgoceae	Leaves
26.	*Harunganamadagascarienis*	Hypericaceae	Root
27.	*Ichnocarpus frutescens*	Apocynaceae	Whole plants
28.	*Kalanchoe pinnata*	Crassulaceae	Leaves
29.	*Kigelia africana*	Bignoniaceae	Fruits
30.	*Lantana camara*	Verbenaceae	Roots
31.	*Mammea africana*	Guttiferae	Stem bark
32.	*Momordica tuberosa*	Cucurbitaceae	Dried tubers
33.	*Moringa pterygosperma*	Moringaceae	Leaves
34.	*Mulberry (Morus Sp.)*	Moaraceae	Leaves
35.	Oroxylum indicum	Bignoniaceae	Whole plant
36.	*Panax ginseng*	Araliacea	Roots
37.	*Pedalium murex*	Pedaliaceae	Dried fruits
38.	*Phaseolus radiatus*	Leguminosae	Seeds
39.	*Phyllanthus amarus*	Euphorbiaceae	Seeds
40.	*Phyllanthus niruri*	Euphorbiaceae	Leaves
41.	*Pimpinella tirupatiensis*	Apiaceae	Whole plant
42.	*Pimpinella tirupatiensis*	Apiaceae	Whole plant
43.	*Piper cubeba*	Piperaceae	Dried berries
44.	*Plectranthus amboinicus*	Lamiaceae	Leaves

45.	*Pongamia pinnata*	Papilionaceae	Flowers
46.	*Portula oleracea*	Portulaceae	Leaves and Stem
47.	*Rhazya stricta*	Apocynaceae	Leaves
48.	*Rubia cardifolia Linn*	Rubiaceae	Root
49.	*Saccharum officinarum*	Poaceae	Jaggery
50.	*Salviae officinalis*	Lamiaceae	Whole plant
51.	*Sida cordifolia*	Malvacea	Leaves & Root
52.	*Solanum xanthocarpum*	Solanaceae	Fruit
53.	*Tinospora cardifolia*	Menispermeacea	Stem
54.	*Tribulus terrestris*	Zygophyllaceae	Fruits
55.	*Vitex negundo linn*	Verbenaceae	Bark
56.	*Withania somnifera*	Solanaceae	Roots
57.	*Zingiber officinale roscoe*	Zingiberaceae	Ginger Rhizome

BERGENIA LIGULATA (*PASHANBHED*)

Saxifragaceae family plants *Bergenia ligulata* (Haw.) Sternb. Another name for it is Elephant's Ears. It is a perennial herb that grows up to 0.3 m by 0.5 m. In Nepal, India, *Bergenia ligulata* is part of the traditional ayurvedic medicine used to treat a variety of illnesses.

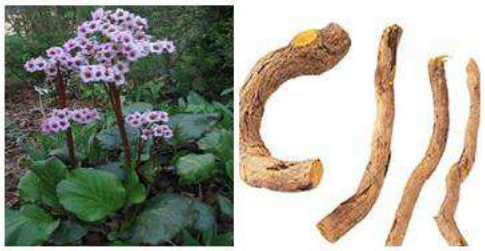

Fig. 1: Morphology of *Bergenia ligulata*(an) Entire Plant (b) Root

Reported Ethno-medicinal Uses

Its qualities are purgative, hostile to scorbutic, tonic, and astringent. Similarly, it is given in cases of fever, hacking, spleen expansion, looseness of the bowels, ulcers, dysuria, and aspiratory friendship. The injured rhizomes have been linked to eye conditions, blisters, cuts, and have antibacterial, mitigating, and anticancer properties. They are also antagonistic to diabetics and urolithiasis. Urinary tract disorders and kidney and bladder stones can be treated with the whole plant, rhizome, and root of *Bergenia ligulata*. In Nepal, urinary discomfort is treated with the plant's juice or powder. [9-18]

AERVA LANATA

In *Ayurvedi*c prescription arrangements, the plant *Aerva lanata* (Linn) Juss. ex Schult, which is a member of the *Amaranthaceae* family, is typically identified and referred to as *Gorakshaganja*. It's one of *Pashanabheda's* two natural springs, according to legend. Many Ayurvedic and Siddha practitioners in southern India use the plant extensively for urinary conditions such as *ashmari* (urinary calculi), *Mootrakrichra* (dysuria), *Mootravikara*, and so forth, for the purpose of *Pashanabheda*.[19]

Fig. 2: Morphology of *Aerva lanata*Plant

Reported Ethno-medicinal Uses

The herbaceous perennial weed *Aerva lanata* Linn. (*Amaranthaceae*) grows wild in India's tropical regions and Western Ghats. According to claims, *Aerva lanata* is beneficial as a diuretic, anthelmintic, antimicrobial, hepatoprotective, hostile to diabetics, expectorant, cytotoxicity movement, urolithiasis, and soothing. The herb has cooling, emollient, vermifuge, suppurative, diuretic, astringent, severe, and lithotripsic properties. Bubbles, cephalalgia, hack, strangury, and lithiasis can all be effectively treated with it. The plant is useful in providing restorative value, and the extract has been shown to have nephroprotective properties as well as diuretic, cytotoxic, immunomodulatory, relaxing, antibacterial, hepatoprotective, and hostile to hyperglycemic effects. **[20-23]**

COLEUS AROMATICUS

Coleus aromaticus(*Syn*: *Coleus amboinicus* Lour. & *Plectranthusamboinicus*) is a tender fleshy perennial plant belonging to the family Lamiaceae with an oregano-like flavor and Oduor. Native to Southern and Eastern Africa, from South Africa and Swaziland to Angola and Mozambique and north to Kenya and Tanzania. It is used as a decorative plant in many houses in south India.

Fig. 3: Morphology of *Coleus aromaticus*(a) Arial Part (b) Leaf

Reported Ethno-medicinal Uses

For instance, *C. aromaticus* is a popular medicinal herb in India, where the leaves are used to cure headaches, coughs, and common colds. Additionally, their antilithiatic, antiepileptic, chemo-preventive, and antioxidant qualities have been demonstrated. *C. aromaticus* is used to treat digestive system disorders, including oral infections, nausea, vomiting, and stomach pain. It is also used as an anthelmintic and purgative. It is widely used as a carminative and to treat dyspepsia, indigestion, and diarrhea. It is also the most commonly mentioned species for treating skin allergies, burns, wounds, sores, insect bites, and bronchitis. It is also used to treat Mycobacterium tuberculosis and chronic coughs. Moreover, fevers, microbial infections, and viruses like HIV and Herpes simplex virus-I have all been linked to its use. Besides, the plant is reported to relieve kidney troubles, decrease vaginal discharges, treat urinary diseases and is drunk after child birth. Additionally, it helps treat congestive heart failure, nervous system disorders, meningitis, seizures related to epilepsy, and conjunctivitis. **[24-31]**

PEDALIUM MUREX

The annual herb *Pedalium murex (P. murex* Linn), a member of the *Pedaliaceae* family, is used medicinally. It grows wild on the coasts of tropical Africa, Mexico, Sri Lanka, and South India. Following summer rains, the plant becomes extremely abundant in and around Visakhapatnam.

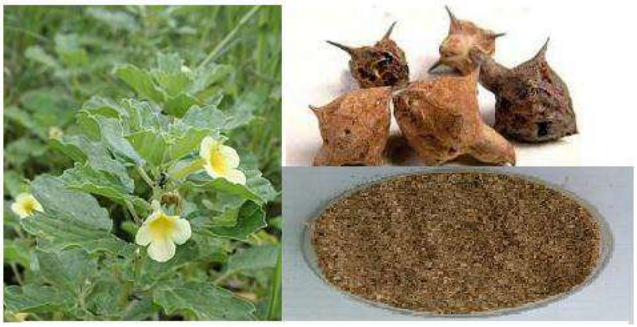

Fig. 4: Morphology of *Pedalium murex* (a) Arial Part (b) Fruits (c) Powder

Reported Ethno-medicinal Uses

Fruits have antispasmodic, diuretic, demulcent, antiseptic, and aphrodisiac properties. It is thought that fruit juice dissolves kidney stones. It acts as a bladder stone remover, purifies blood, and is a cooling tonic.

An infusion or extract prepared from theleaves, stems and fruits in cold water of *Pedalium murex* are found to be useful in the treatment of disorders of urinary systems such as gonorrhea, dysuria, and incontinence of urine etc. [32-35]

CYNODON DACTYLON

Cynodondactylon, sometimes referred to as "***Doob***" in Hindi, is a member of the *Poaceae* family and is commonly used as a creeper in India. It is indigenous to southern Europe, Asia, East Africa, and Australia. *Cynodon* is a weed that has been shown to have a number of possible health benefits.

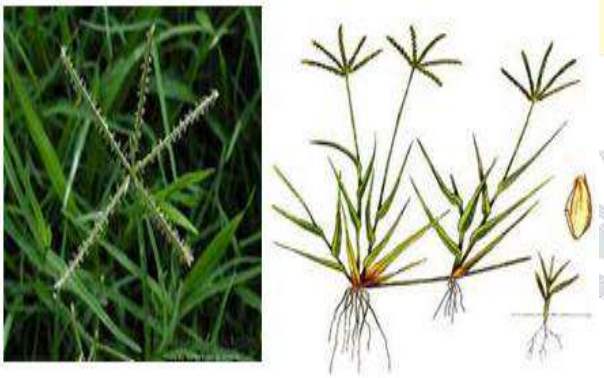

Fig. 5: Morphology of *Cynodon dactylon* (a) Arial Part (b) entire plant

Reported Ethno-medicinal Uses

It is used to treat wounds and induce dyspepsia in traditional medicine. It is said to have astringent, cyanogenetic, aperient, antiseptic, and alterative properties.

It is used to treat wounds and induce dyspepsia in traditional medicine. It is said to have astringent, cyanogenetic, demulcent, depurative, diuretic, emollient, sudorific, and vulnerary, aperient, antiseptic, and alterative properties. It has been reported to induce hay fever, contact dermatitis, and photosensitization in animals. Anasarca, calculus, cancer, carbuncles, convulsions, warts, diarrhea, dropsy, dysentery, epilepsy, headache, hemorrhage, hypertension, hysteria, insanity, laxative, measles, rubella, snakebite, sore stones, tumors, urogenital disorders, warts, and wounds are among the conditions for which it is a folk remedy. [36-38]

CONCLUSION

Through a variety of mechanisms, such as their diuretic and antioxidant qualities, Indian medicinal herbs offer promising nephroprotective advantages. Their incorporation into mainstream nephrology may be facilitated by thorough investigation and standardisation.

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