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A REVIEW ON SOME NEPHROPROTECTIVE MEDICINAL PLANTS

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ABSTRACT

Nephrotoxicity is one of the most common kidney problems and occurs when body is exposed to a drug or toxin. A number of therapeutic agents can adversely affect the kidney resulting in acute renal failure, chronic interstitial nephritis and nephritic syndrome because increasing number of potent therapeutic drugs like aminoglycoside antibiotics, chemotherapeutic agents and NSAIDS. Nephroprotective agents are the substances which possess protective activity against nephrotoxicity. Medicinal plants have curative properties due to the presence of various complex chemical substances. The present review is about the some of the medicinal plants possessing nephroprotective activity on Cisplatin and Gentamicin induced nephrotoxicity.

INTRODUCTION: Nephrotoxicity is one of the most common kidney problems and occurs when body is exposed to a drug or toxin. When kidney damage occurs, body unable to rid of excess urine and wastes from the body and blood electrolytes (such as potassium and magnesium) will all become elevated.

A number of therapeutic agents can adversely affect the kidney resulting in acute renal failure, chronic interstitial nephritis and nephritic syndrome because increasing number of potent therapeutic drugs like aminoglycoside antibiotics, chemotherapeutic agents and NSAIDS have been added to the therapeutic arsenal in recent years. Exposure to chemical reagents like ethylene glycol, carbon tetra chloride, sodium oxalate and heavy metals like lead, mercury, arsenic and cadmium also induces nephrotoxicity. Prompt recognition of disease and cessation of responsible drug are usually the only necessary therapy.

Nephroprotective agents are the substances which possess protective activity against nephrotoxicity. Medicinal plants have curative properties due to the presence of various complexes Chemical substances. Ancient literature has prescribed various herbs for the cure of kidney disease.

Co-administration of various medicinal plants possessing nephroprotective activity along with different nephrotoxic agents may attenuate its toxicity. The following are some of the medicinal. Plants review possessing nephroprotective activity [1, 2, 3].

PLANTS CONTAINING PROTECTIVE ACTIVITY AGAINST CISPLATIN INDUCED NEPHROTOXICITY

Name of the plant	Family	Parts used	Chemical constituents
Aerva javanica	Amaranthaceae	Fresh Roots	Isoquercetin, 5 methylmellein, 2- hydroxy-3-O-β primeveroside naphthalene-1,4-dione, Apigenin7-Oglucoronide and Kaempferol.[5]
Aerva lanata	Amaranthaceae	Whole plant	Botulin, β-sitosterol, Amyrin, Hentriacontane, Campesterol, Stigmasterol, Kaempferol, Starch, Propionic acid, β-carboline-I, Aervoside, Aervolanine[23].
Bauhinia variegatea linn	Caesalpiniaceae	Stems	stigmasterol, flavone glycosides, lupeol, kaempferol-3-glucoside, β-setosterol .[21]
Cassia auriculata	Fabaceae	Roots	Tannins, Di-(2-ethyl) hexyl phthalate, Alkaloids, Resins, Ca2+ and Phosphorous.[24]
Carica papaya	Caricaceae	Seeds	Seed Flavonoids, Phenols, Alkaloids, Protein, Sterols, Terpenoids, Carbohydrates, Steroids, Tannins, Glycosides, Terpenes and Saponins.[5]
Ceratonia silique	Fabaceae	Pods and Leaves	Flavonoids. [7]
Cucurbita pepo	Cucurbitaceae	Seeds	Flavonoids, Phenols, Alkaloids, Protein, Sterols, Terpenoids, Carbohydrates, Steroids, Tannins, Glycosides, Terpenes and Saponins.
Dichrostachys cinera	Mimosaceae	Roots	Fixed oils, Steroids, Flavonoids, Wight & Arn14 Phenolic compounds, n-octacosanol,β- sitosterol, β-amyrin acetate, Friedelan 3-one, Friedelan 3-ol, Friedlen and α amyrin.[8]
Ficus religiosa	Moraceae	Latex	Amino acids and Tannins.[9]
Kigelia Africana	Bignoniaceae	Matured fruits	Iridoids, Naphthoquinones, Flavonoids, Terpenes, Tannins, Steroids, Saponins and Caffeic acid.[10]
Lepidium sativum	Brassicaceae	Seeds	Volatile essential aromatic oils, Fatty oils, Carbohydrate, Protein, Fatty acid, Vitamin B-carotene, Riboflavine, Niacin, Ascorbic acid, Flavonoids, Glycosides and Isothiocynates.[11]
Panax ginseng	Araliacae	Roots	Saponin, glycosides, Ginsenosides (Dammarol), Panaxosides (Oleanolic acid) and Chikusetsu saponin. [4]
Picrorhiza kurroa Royle	Scrophulariaceae	Rhizome	Tannins.[13]
Pongamia pinnata	Papilionaceae	Flowers	Flowers Pongamol, Protien, Alkaloids, Tannins, Sugar, Resin and Fatty oil (Karanjin). [4]
Salviae radix	Lamiaceae	Whole plant	Salvianolic acid A-G, Rosmarinic acid, Lithospermic acid, Isoferulic acid, Tanshinone I, IIA, IIB, Cryptotanshinone V-VI, Isotanshinones I-II,IIB and Hydroxytanshinones IIA. [4]
Vernonia cinerea	Compositae	Aerial parts	Triterpenoids like α-amyrin, β-amyrin and lupeol.[14]

PLANTS CONTAINING PROTECTIVE ACTIVITY AGAINST GENTAMICIN INDUCED NEPHROTOXICITY:

NAME OF THE PLANT FAMILY PARTS USED AND CHEMICAL CONSTITUENTS:

Name of the plant	Family	Parts used	Chemical constituents
Aegle marmelos	Rutaceaeae	Leaves	Aegeline, Agelinine, Rutin, Sterol, β-sitosterol, β-D-glucoside, Mamesinine, Lupeol, Tannins, Phlobatannins, Flavonoids, Umbelliferone, Quercetin and Volatile oils.[15]
Aerva lanata	Amaranthaceae	Whole plant	Botulin,β-sitosterol, Amyrin, Plant Hentriacontane, Campesterol, Stigmasterol, Kaempferol, Propionic acid, β-carboline-I, Aervoside and Aervolanine.[23]
Bauhinia variegata	Caesalpiniaceae	Stem	Stigmasterol, flavone glycosides, lupeol, kaempferol-3-glucoside, β-setosterol.[22]
Cassia auriculata	Fabaceae	Roots	Tannins, Di-(2-ethyl) hexyl phthalate, Alkaloids, Resins, Ca2+ and Phosphorous. [24]
Crataeva nurvula	Capparidaceae	Fruits	Kaemferol-3-O-a-D-glucoside, Quercitin-3-O-a-D-glucoside, Flavonoids, Glucosinolates, Steroids, Lupeol and Tannins. [4]
Emblica officinalis	Euphorbiaceae	Fruits	Vitamin-C, Carotene, Nicotinic acid, Riboflavin, D-glucose, D-fructose, Myoinositol, a Pectin with D-galacturonic acid, Darabinosyl, D-xylosyl, L-rhamnosyl, G-glycosyl, D-manosyl, D-galactosyl, Embicol, Mucic and Phyllambic acid, Phellembin, Fatty acid, Leucodelphinidine, Procyanidin, 3-O-gallated Prodelphindin, Tannins, Ellagic acid, Lupeol and Oleanolic acid.[4]
Glycyrrhiza glabra	Fabaceae	Rhizomes	Glycyrrhizin, Glyciyrrhizic acid, Glycosides, Steroids, Glucose, Sucrose, Resin, Starch and Essential oil. [4]
Hygrophila spinosa	Acanthaceae	Whole plants	B-sitosterol, Lupeol, Minerals like Anders6 Plant Na, K, Ca, P and Poluphenols.[16]
Kalanchoe pinnata Pars	Crassulaceae	Leaves	Leaf Alkanes, Tricontane, Alpha & Beta Amyrin, Beta-Sitosterol, Fumaric acid, Mallic acid, Citric Acid, Quercetin, Kaempferol, Calcium Sulphate and Calcium Oxalate.[17]
Morinda citrifolia L	Rubiaceae	Fruit	Americanol A, 3, 31-bis dimethyl pinoresinol, Americanin A, Americanoic acid A, Morindolin and Isoprincepin. [18]
Nigella sativa	Ranunculaceae	Whole plant	Alanine, L-Spinasterol, Arabic acid, Arginine, Amino acid, Aspargine, Aspartic acid, Carvone, Cystine, Cholesterol, Glutamic acid, Linoleic acid, Linolenic acid, Melanthin, Myristic acid, Oleic acid and Tannins. [4]
Ocimum sanctum	Lamiaceae	Leaves	Eugenol, Eugenol methyl ether, Carvacrol, Caryophyllene, Ursolic acid, Apigenin, Luteolin, Ascorbic acid, Carotene, Alkaloids, Glycosides, Saponins and Tannins [19]
Orthosiphon stamineus	Laminaceae	Whole plant	Flavanoids, Phenols, Carbohydrates, Steroids, Tannins, Glycosides, Terpins and Saponins.[19]
Rhazya stricta	Apocynaceae	Leaves	1-carbomethoxy-β-carboline, Condyloacarpine and Vincanicine. [4]
Solanum nigrum	Solanaceae	Whole plant	Alkaloids, Reducing sugars, Glycosides, saponins, Steroids, Leutein, Lycopene, Vitamin-c, Glucose, Fructose, Caffeicsolasodine, Tamatidenol, Solamargine, Solasomine, Trigogenine, Pottasium, Sulphur, Calcium and Phosphorous. [4]
Strychnos potatorum	Loganiaceae	Seeds	Flavanoids, Phenols, Saponins, Alkaloids, Steroids, Tannins, Glycosides, and Lignins [20].
Tribulus sativus	Zygophyllaceae	Fruits	Alkaloids, Harmine, Harman, Saponins, Steroidal Sapogenins (Diosgenin, Gitogenin, Chlorogenin and Ruscogenin), Flavanoids, Kaemferol, Tribuloside, Fixed oil, Resin, Essential oil and Nitrates. [4]
Withania somnifera	Solanaceae	Roots	Alkaloids (Somniferon), Withaminon, Wasamin, Sugars, Glycosides, Amino acids, Essential Oils, Withaniol, Hexatriacontane, Phyto sterol and oils. [4]

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