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Review article

# Herbal drugs: A boon in various pathological complications

**Shashidhar Mehta*[1], Shaveta Bhardwaj[2], Suhasini Bhatnagar[1], Sandhya S Mehta[3], Puneet Sudan[4], Rajesh Pandey[5]**

[1]Department of Biochemistry, Mewar University, Rajasthan.
[2]Assistant Professor, PCTE Group of Institutes, Badowal, Ludhiana.
[3]Department of Microbiology, LHMC & SK Hospital, New Delhi.
[4]Chandigarh College of Pharmacy, Landran, Punjab.
[5]All Excel Inc., 135 Wood Street Suite 201 West Haven, CT 06516.

## Abstract

Herbal drugs and traditional remedies are used from long before century and are universally accepted and therefore scientists are involved in this area. Around 80% population relies upon herbal products because they have been considered as safe, effective and economical and are devoid of side effect. The various parts of the both plants (*A. Indica and M. Koenigii*) are also used by tribal communities and thus the review focus some pharmacological and biochemical molecular role of the plant such as activity on cardiovascular, anti- diabetic and anti- hyperlipidaemia, antimicrobial, antiulcer, anti - oxidative, cytotoxicity, diarrhoea activity, antifungal and wide array of properties. Thus, they may serve as effective and safe adjunct in treatment against various pathological conditions.

**Key words:** A. indica; M. koenigii; treatment; Medicinal activity.

***Corresponding Author: Shashidhar Mehta,** Department of Biochemistry, Mewar University, Rajasthan.

## 1. Introduction

India is rich in the medicinal herbs and man uses plants in numerous ways to meet his basic needs food, clothing and shelter. Medicinal plants have been used by mankind. From the starting of human civilization herbal products such as spices, herbal teas, functional food ingredients, medicinal raw materials, aromatic plants, essential oils, flavouring, fragrant products and dietary supplements are of immense importance to mankind [1].

The two species of neem are: *A. indica, A. juss* and *M. azedarac*, the first one is popularly known as Indian neem (margosa tree) or Indian lilac, and the other is known as the Persian lilac. Neem has been extensively used in ayurveda, unani and other traditional system of medicine and after 135 compounds have been isolated from different parts of neem. The compounds is classified into two major classes: isoprenoids in which

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diterpenoids and triterpenoids containing protomeliacins, limonoids, azadirone and its derivatives, gedunin and its derivatives, vilasinin type of compounds and C-secomeliacins such as nimbin, salanin and azadirachtin ) and second one includes which are mainly proteins non-isoprenoids, (amino acids) and carbohydrates (polysaccharides), sulphurous compounds, polyphenolics such as flavonoids and their glycosides, dihydrochalcone, coumarin and tannins, aliphatic compounds, etc. moeopathic medicine. Thus the herbal drugs are used very often [2].

**Biological activity of Neem**

Neem has been used for long decades and include Anti-inflammatory; Antiarthritic; Antipyretic; Hypoglycaemic; Antigastric ulcer; Spermicidal; Antifungal; Antibacterial; Diuretic; Antimalarial; Antitumour; Immunomodulatory include wide array of activities which are of treatment importance.

It is also used in treatment of rheumatism, chronic syphilitic sores and indolent ulcer has also been evident. Then widespread use of neem out in various skin infections is also ruled out by various studies conducted in the past. Bark, leaf, root, flower and fruit also cure blood morbidity, biliary afflictions, itching, skin ulcers, burning sensations and pthysis. The branches of *Azadirachta indica* (neem) are very popular for cleaning the teeth used as datum [3].

**Phytochemistry**

**Immuno-stimulant activity**

The use of extract of neem bark and leaf also showed anticomplement and immuno-stimulant activity. Neem oil cause the selective activation of the cell-mediated immunity to activate enhanced response to subsequent mitogenic or antigenic challenge and change showed good results.

**Hypoglycaemic activity**

Aqueous extract of neem leaves cause attenuation in level of blood sugar level and prevents adrenaline as well as glucose-induced elevated glucose level. Recently, hypoglycaemic effect was observed with leaf extract and seed oil, in normal as well as alloxan-induced diabetic rabbits.

**Antiulcer effect**

The leaf and bark aqueous extracts of neem showed produced good antisecretory and anti ulcer effect.

**Antifertility effect**

Intra-vaginal application of neem oil, prior to coitus, cause prevention in pregnancy and showed to be an effective contraceptive agent. It could be a novel method of contraception.

**Antimalarial activity**

Neem seed and leaf extracts are effective against main two types of parasitic activity including chloroquine-resistant and sensitive strain malarial parasites [6].

**Antifungal activity**

Extracts of neem leaf, neem oil seed kernels are effective against certain fungi including Trichophyton, Epidermophyton, Microspor Trichosporon, Geotricum and Candida.

**Antibacterial activity**

The oil extracted from the leaves, seed and bark showed a wide array of activities antibacterial action against Gram-negative and Gram-positive microorganisms, the major ones a M. tuberculosis and streptomycin resistant strains. It also cause inhibition in vitro *Vibrio cholera, Klebsiellapneumoniae, M.*

*tuberculosis and M. pyogenes.* Antimicrobial effects of neem extract have been demonstrated against Streptococcus mutans and S. faecalis.

**Antiviral activity**

The aqueous leaf extract of herbal plant offers antiviral activity against Vaccinia virus, Chikungemya and measles virus.

**Anticancer activity**

Neem leaf aqueous extract is an effective suppression of oral squamous cell carcinoma induced by 7, 12-dimethylbenz [a] anthracene (DMBA), as showed by alteration in progression of neoplasm. Neem may exert its chemopreventive effect in the oral mucosa by showing a glutathione and its metabolizing enzymes role in progression against cancer [5].

**Antioxidant activity**

Antioxidant activity of neem seed extract has been demonstrated in vivo during horse- grain germination muscles.

**Effect on central nervous system**

Central nervous system (CNS) depressant activity in mice was showed with the leaf extract. Fractions of acetone extract of leaf also showed significant CNS depressant activity.

**Possible medicinal applications of neem**

**Neem extract**

It causes an effective activity to cure ringworm, eczema and scabies. Lotion derived from neem leaf, when locally applied, can cure these dermatological diseases within 3-4 days in acute stage or a fortnight in chronic case. A paste prepared with neem and turmeric was showed effective in the treatment of scabies in clinical study.

The use of neem leaf extract has been prescribed for oral use for the treatment of malaria by Indian practitioners of homeopathic origin from many decades ago. Recently, a clinical trial has been carried out to see the efficacy of neem extract to control elevated lipid level in a subjective suffered from malaria severely infected with P. falciparum [4].

**Murraya koenigii**

Murraya Koenigii is known by various synonyms like karipatta in Hindi and has a strong peculiar odour. People generally use the fresh leaves, dried leaf power and essential oil for flavouring soups, curries, fish and meat dishes etc. It is also used as a stimulant, anti-dysentric and in the treatment of diabetes mellitus. The plant is highly valued for its leaves as an indispensable ingredient in an Indian cuisine to promote appetite and digestion. The leaves, root and bark are used as tonic, stomachic and carminative. The leaves and roots of *M. Koenigii*are bitter, acrid, cooling, anti-helminthic, analgesic. It is also useful in leucoderma and blood disorders. The juice of the root has also emerged for pain associated with kidney. The branches of *M. koenigii* are very effective for cleaning the teeth and is used as datum.

It is basically found in tropical Asia like foothills of Himalayas of India, Sri Lanka, Myanmar, Indonesia, Southern China and Hainan and other countries [7].

**Phytochemistry of *M. Koenigii***

Mature leaves contains an amount of 63.2% moisture, 1.15% total nitrogen, 6.15% fat, 18.92% total sugars, 14.6% starch, 6.8% crude fiber, ash 13.06%, acid insoluble ash 1.35%, alcohol soluble extractive 1.82%, cold water (20˚C) extractive 27.33% and a maximum of hot water soluble extractive 33.45 [9].

The leaves showing aromatic content and contain proteins, carbohydrates, fiber,

minerals, carotene, nicotinic acid and vitamin C. It also contain vitamin A and calcium The leaves contain high amount of oxalic acid, leaves also contains crystalline glycosides, carbazole alkaloids, koenigin, resin, fresh leaves contain yellow colour 2.5% volatile oil. It also possess girinimbin, iso-mahanimbin, koenine, koenigine, koenidine and koenimbine. The compounds like Mahanimbicine and bicyclomahanimbicine, phebalosin, coumarine as Murrayoneimperatoxin etc isolated from leaves 25. Bark mainly contains thecarbazole alkaloids as such murrayacine, murrayazolidine, murrayazoline, mahanimbine, girinimbine, koenioline, xynthyletin [8].

**Antibacterial activity**

Research done in the previous studies showed that essential oil from M. koenigii leaves showed effective antibacterial effect against various stains of *B. subtilis, Staph. aureus, C. pyogenes, P. vulgaris and Pasteurellamulticida*. The pure oil was active against the first three organisms even at a dilution of 1: 50027. The acetone extract of the fresh leaves of M. koenigii on fractionation gives three bioactive carbazole alkaloids named as mahanimbine, murrayanol and mahanine, and had shown mosquitocidal, antimicrobial and topoisomerase I and II inhibition activities [12].

**Antifungal Activity**

Acetone extract of M. koenigii showed protective effect against *Aspergillus niger*. Its benzene extract is most active against *Alternaria solani* and *Helminthosporium solani* and ethanol extract showed activity against *Penicillum notatum*.

**Antioxidant Activity**

The literature showed that the anti-oxidative properties of the extract of *M. koenigii* leaves and have shown activity in different solvents. They were evaluated on the basis of oil stability index (OSI) together with their radical scavenging ability against 1-1-diphenyl-2-picryl-hydrazyl (DPPH) and thus proves it utmost role. The methylene chloride ($CH_2Cl_2$) extract and the ethyl acetate (EtOAc) soluble fraction of the 70 % acetone extract was prolonged the OSI values significantly compared to those of tocopherol and BHT. Five carbazole alkaloids were isolated from the $CH_2Cl_2$ extract and their structures were identified to be as euchrestine, bismurrayafoline, mahanine, mahanimbicine and mahanimbine. The results were obtained by 1H and 13C NMR and mass (MS) spectral data.

**Cytotoxic Activity**

The alkaloid koenoline isolated from the root bark of *M. koenigii* is found to exhibit cytotoxic activity against KB cell culture system. Carbazole alkaloids isolated from the stems are found to have significant effects in the growth of the human leukaemia cell line HL-60. Mahanine, Pyrafoline-D and murrafoline-I (Carbazole alkaloids)showed significant cytotoxicity against HL-60 cells and cause a significant loss in mitochondrial membrane potential [10].

**Anti-inflammatory activity**

Stem bark of alcoholic extract in a dose of 1 gm/kg body weight showed protective effect against carrageenan-induced inflammation. Crude root extract also showed anti-inflammatory activity in rat model. Ethanolic extract in dose of 300 and 400 mg/kg also showed antihistaminic actions in the histamine-aerosol protocol in rodent model. The mast cell stabilization and antihistaminic effects of EEMK were suggested to be the probable mechanisms for its anti-

inflammatory action and thus attains its therapeutic value.

**Antidiarrhoeal activity**

Bioactive alkaloids like, kurryam and koenimbine obtained from fractionated n-hexane extract of the seeds of M. koenigii were showed inhibitory action in reference to castor oil-induced diarrhoea and prostaglandin E2-induced enteropooling in strain of Wistar rats in charcoal meal test in Wister rats, these compounds were found to exhibit significant reduction in gastrointestinal motility and play mandate role in studying the modulatory role in disease progression [11].

## Conclusion

*Azadirachta Indica* and Murraya Koenigii are versatile plant and it is in use from ancient decades like rich source of multipotential medicinal plants. Both plants has best classical approach in search of new lead molecules for management of various diseases. Murraya koenigi is a multi-potential medicinal plant. Almost each and every part of the plant has numerous medical applications. Thus, it can be consider being a most suitable candidate for new drug discovery.

The study in the future needs active isolation of the various constituents in scientific manner so that extrapolation of the data can be done in clinical studies in order to pave a new way for the benefit of mankind using these herbal molecules and thus they emerge as new effective therapeutic measures in order to combat the disease.

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