Review Paper

Medicinal Property of Murraya Koenigii - A Review

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Abstract

The medicinal plants are almost the exclusive source of drugs for majority of world population today. People want to use herbal drugs because they are considered as safe, inexpensive and have no adverse effects. Plants are also very useful because they can self-generate and can produce a range of beneficial bioactive products. Murraya koenigii belongs to family Rutaceae which can be used as medicines to cure various ailments. It is seen that the different tribal communities have used the various parts of this plant. The present review is an attempt to highlight various ethno-botanical and traditional use as well as phytochemical reports of Murraya koenigii.

Keywords: Murraya koenigii, phytochemistry, medicinal property.

Introduction

In preparing traditional medicine, plants have been used since ancient times. India is rich in the medicinal herbs and therefore, it can be accurately called the “Botanical Garden of the world”¹. Medicinal plants have been used by mankind for its curative quality since the starting of human civilization. We have been getting a huge amount of medicinal agents since a long time from nature and we can produce multitude of modern drugs with the help of these agents. Nowadays, it has been seen that people are craving towards the use of herbal medicine for any kind of treatment because it is far better than the high cost of modern medical care which is beyond the reach of poor. Besides, it has no side-effect and can cure the patient for any kind of infectious diseases². The basic medicinal property of these plants lies in some chemical substances. These chemical substances produce a definite physiological action on human body which is generally known as phytochemicals. These chemicals are non-nutritive and act like shield against diseases. The most important of these phytochemicals are alkaloids, flavonoids, tannins and phenolic compounds³.


Murraya koenigii, popularly known as curry leaf in any Indian languages. It is basically known for its' aroma and medicinal property. Most part of plant is covered with fine down and has a strong peculiar smell. It is more or less deciduous shrub or tree up to 6 m in height and 15-40 cm in diameter with short trunk, thin smooth grey or brown bark and dense shady crown⁴,⁵. Leaves, exstipulate, bipinnately compound, 30 cm long, each bearing 24 leaflets, having reticulate venation; leaflets, lanceolate, 4.9 cm long, 1.8 cm broad, having 0.5-cm-long petiole⁶. Flowers are white, ebracteate, scented and small in size. Calyx deeply five cleft, pubescent. Petals five, free, whitish, glabrous and with dotted glands. It bears fruits in close clusters/bunches, small, ovoid or sub-glucose, glandular, thin pericarp enclosing one or two seeds having spinach green color⁷.

Distribution

Murraya koenigii is basically found in tropical Asia like the foothills of Himalayas of India, Sri Lanka, Myanmar, Indonesia, Southern China and Hainan. In India, one can find it Sikkim, Garhwal, Bengal, Assam, Western Ghats and Travancore-Cochin. It reproduces the means of seeds which germinate freely under partial shade. It is also available in other part of Asian region like in moist forests of 500-1600 m height in Guangdong, S Hainan, S Yunnan (Xishuangbanna), Bhutan, Laos, Nepal, Pakistan, Sri Lanka, Thailand, Vietnam. Together with South Indian immigrants, curry leaves reached Malaysia, South Africa and Réunion island. They are hardly found outside the Indian sphere of influence⁸-¹⁰.

Ethnobotanical Use

People generally use the fresh leaves, dried leaf powder and essential oil for flavoring soups, curries, fish and meat dishes, egg dishes, traditional curry powder blends etc. The aromatherapy industry uses the essential oil in the making of soaps and cosmetics¹¹. For natural hair tone and hair growth,
one can use the blanked residue of boiled curry leaves along with coconut oil. It can be used as anthelmintics, it also acts as febrifuge, blood purifier, antifungal, depressant, anti-inflammatory, body aches, for kidney pain and vomiting. Murraya koenigii is used as a stimulant and antisyndertic. It is also effective against diabetes Mellitus. Leaves are applied externally to bruises and eruption. The leaves and roots are bitter in taste analgesic, cure inflammation and itching. It is also useful in leucoderma and blood disorders and also cures diseases like piles. It can be also used to stop vomiting by infusion of the toasted leaves. If someone is bitten by poisonous animals, local application of the leave paste is effective.

**Phytochemistry**

Mature leaves contains 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%. Leaves are aromatic and contain proteins, carbohydrates, fiber, minerals, carotene, nicotinic acid and vitamin C. It is rich in vitamin A and calcium. The leaves contain high amount of oxalic acid, leaves also contains crystalline glycosides, carbazole alkaloids, koenin, resin, fresh leaves contain yellow color 2.5 % volatile oil. It also contains giringinin, iso-mahaniminbin, koenine, koenigne, koenindine and koenimbine. Mahanimbicine and bicyclomahanimbicine, phebalosin, coumarine as Murrainone fractionated n-hexane extract of the seeds of M. koenigii show significant cytotoxicity against HL-60 cells and also induced loss of mitochondrial membrane potential.

**Antibacterial activity**

The essential oil from M. koenigii leaves showed antibacterial effect against B. subtilis, Staph. aureus, C. pyogenes, P. vulgaris and Pasteurella multicauda. The pure oil was active against the first three organisms even at a dilution of 1: 500. The acetone extract of the fresh leaves of M. koenigii on fractionation gives three bioactive carbazole alkaloids named as mahanimbine, murrayanol and mahanine, which has shown mosquitocidal, antimicrobial and topisomerase I and II inhibition activities.

**Antifungal Activity**

Acetone extract of M. koenigii is active against Aspergillus niger, benzene extract is most active against Alternaria solani and Helminthosporium solani and ethanol extract is active against Penicillium notatum.

**Antioxidant Activity**

The literature showed that the antioxidative properties of the extract of M. koenigii leaves were done using different solvents. They were evaluated on the basis of oil stability index (OSI) together with their radical scavenging ability against 1,1-diphenyl-2-picrylhydrazyl (DPPH). The methylene chloride (CH2Cl2) 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 CH2Cl2 extract and their structures were identified to be euchrestine, bismurrayafoline, mahanine, mahanimbicine and mahanimbine based on 1H and 13C NMR and mass (MS) spectral data.

**Cytotoxic Activity**

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 effects the growth of the human leukemia cell line HL-60. Mahanine, Pyrafoline-D and murrafoline-I (Carbazole alkaloids) showed significant cytotoxicity against HL-60 cells and also induced loss of mitochondrial membrane potential.

**Anti-inflammatory activity**

The alcohol extract of stem bark (1 gm/kg body weight) is effective against carrageenan-induced inflammation. Crude root extract also showed anti-inflammatory activity. Ethanolic extract of M. koenigii (EEMK) (300 and 400 mg/kg) showed antihistaminic actions in the histamine-aerosol protocol. The mast cell stabilization and antihistaminic effects of EEMK were suggested to be the probable mechanisms for its anti-inflammatory action.

**Antidiarrhoeal activity**

Bioactive alkaloids, kuryam and koenimbine obtained from fractionated n-hexane extract of the seeds of M. koenigii were found to exhibit inhibitory activity against castor oil-induced diarrhoea and prostaglandin E2-induced enteropooling in rats in charcoal meal test in Wister rats, these compounds were found to exhibit significant reduction in gastrointestinal motility.

**Summary:** From the available literature it can be stated that Murraya koenigii is a versatile medicinal plant and it has a rich source of biologically active compound which makes it a multipotential medicinal plant. In future study, the isolated principles from curry leaf needs to be evaluated in scientific manner using scientific experimental animal models and clinical trials to understand the molecular mechanism of action, in search of lead molecule from natural resource.

**Conclusion**

Murraya koenigii is a multipotential 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.
References


