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Murraya Koenigii There Therapeutic Activity

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Abstract

Murraya koenigii is a multipurpose plant, the plant is a native of India. It is found in tropical and sub-tropical region in the world. All parts of plants is useful for treat and cure various diseases and useful for preparation of various pharmaceutical formulation and cosmetic preparation. The leaves of plant are use as tonic, stomachic, carminative, internally in dysentery, vomiting. Used as anti- helminthic, analgesic, cures piles, allays heat of the body thirst, inflammation and itching. The plants contains many major phytochemical compounds, vitamins and nutrients, it also rich source of nutrients and also it contains many pharmacological activity like anti-inflammatory, anti-pyretic, hypoglycemic, anti-ulcer wound anti-healing , anti-microbial, anti-fungal and memory enhancing etc…

Keywords :

Pharmacological activity; anti- oxidant activity.

Introduction :

In India, the different systems of medicinal usage like ayurveda, siddha, Unani, and health traditions, focuses on the use of plant products for the treatment of human and animal diseases. Murraya koenigii, which commonly known as curry leaf or kari patta in India, belong to family Rutaceae which also represent more than 1600 species and 150 genera.

Various Names of Murraya Koeniigii

- English : Curry leaves
- Kannada : Karibevu karipatta
- Hindi : Mithanium
- Tamil : Kariveppilai
- Malayalam : Kariveppu
- Marathi : Kadhilimb

- **Plant description and habitate**

The plant is distributed and cultivated throughout India and cochin. Propagation is done by seeds which germinate freely under particle shade. M. Koeniigii is an unarmed, semi deciduous aromatic shrub or small tree with slender but strong woody stem and branches covered with dark grey bark, leaves are imparipinnate, glabrous, and very strongly aromatic leaflets 9-25 or more short stalked, alternate, gland dotted and strongly aromatic. Among the 14 global species belonging to the genus of murraya, only two, M. koenigii and M. paniculate, are available in india. M. koenigii is more important due to its huge spectrum of traditional medicinal properties. M. koneigii leaves are slightly bitter in taste, pungent in smell, and weakly acidics. The green leaves of M.koneigii are used in treating piles, inflammation, itching, fresh cuts, dysentery, bruises, and edema. The roots are purgative to some extent. They are stimulating and used for common body aches. The bark is helpful in treating snakebites.

- **Chemical constituents :**

Carbazole alkaloids and other important metabolite,like terpenoides, flavonoids, phenolics, carbohydrates, carotenoids, vitamins, and nicotinic acid from different parts of the M. koenigii plant.

- **Pharmacological activity**

Murraya koenigii has been mentioned in the traditional medicinal system ayurveda. The murraya koenigii bark, root, leaves, fruits and pulp are widely used in the treatment of antioxidant, anti inflammation, hepatotoxicity, diabetes, obesity, vomiting, constipation, indigestion, diarrhoea, dysentery, piles, nausea, to relieve kidney pain etc. it contains somany pharamacological activities and therapeutic bioavilability.

- **Anti-fungal activity**

The anti fungal activity of leaves of M. koenigii is due to the presence of phytochemical constituents of complex molecular structures and diverse action mechanism, viz. alkaloids, terpenoids, flavonoids, phenolics, tannins and saponins, which are known for their antimicrobial properties. Different investigations support the traditional use of the plant as an antifungal agent. In vitro antifungal activity may explain the use of curry leaves for the treatment of diarrhoea, dysentery, and skin eruptions in folklore medicines bioactive compounds of M. koenigii appreciably hold the ability of mycelial growth inhibition and thereby promote anti fungal activity. The anti fungal activity of M. koenigii against a wide range of pathogenic fungi has been studied. Penicillium notatum, aspergillus flavus, aspergillus niger etc. were isolated from infected saplings and spoiled foods based on alterations of there growth characteristics, mycelial morphology, and spore morphology. The ethanolic extract of M. koenigii exhibited notable effects on the hyphal morphology; namely, an increase in branching potential, which sulted in the development of short slender branches of hyphae with swollen tips. Such effects are usual for any antifungal compounds like girinimbine, murrayanine, marmesin-1-beta-D' galactopyranoside, mahanine, murrayacine, mukoeic acid, murrayazolinine, girinimbilol, pyrafoline-D, and murrafoline-1 are present in the stem bark. Girinimbine, murrayanine, and marmesin-1'-beta-D' galactopyranoside, have notable anti-fungal activity.

- **Anti bacterial activity**

The unsystematic use of antibiotics promotes the development of multiple drug-resistant pathogenic strains of bacteria, which are very harmful, and there is lack of proper treatment procedure for these ailments. Therefore, the need to search for new antimicrobials remains. Currently, in addition to antibiotics and chemically- synthesized drugs, curiosity for alternative medicines, such as natural or herbal medicines, is increasing. They may have fewer side effects or toxicity owing to their natural sources combating microbial

infections without side effects is always a tedious process. In this regard, in additions to classical antibiotics and synthetic drugs, there is an ongoing hunt for potent molcules from natural herbals medicines. M. koenigii extracts have demonstrated antibacterial effects on a wide variety of microorganisms. Methanol and ethanol extracts of M. koenigii leaves were found to be effective against the bacterial strains Escherichia coli, staphylococcus, streptococcus, and proteus. Hence, M. koenigii leaves could be efficiently used as a natural remedy in everyday meals for the prevention of several bacterial infections. Pyranocarbazoles isolated from M. koenigii exhibited antibacterial activity on bacterial strains of staphylococcus aureus and klebsiella pneumonia.

- **Immunomodulatory activity**

The immune system makes a network and regulates processes important for maintaining the health of an organisms by hindering the entry and invasion of microbes. Impairments in the immune system lead to conditions from chronic inflammation to cancer. In an investigation on the humoral and cell mediated immune response to ovalbumin, the immunomodulatory activity of a methanolic extract of M. koenigii leaves was evaluated using a carbon clearance test. A considerable increases the number of production indicated the increased phagocytic activity of macrophages. The M. koenigii extract holds promise as an immunomodulatory agent, which act by stimulating humoral immunity and the phagocytic function. the M. koenigii leaf extracts were reported to have certain effects in regulating mice immunology related to oxidative stress metabolism. An M. koenigii leaf extract can exhibit an immunomodulatory effects can exhibits an immunomodulatory effect through which it can regulated the oxidative stress metabolism in diabetic mice.

- **Antidiabetic activity :**

Most prominently in developing countries, medicinal plants play a helpful role in managing diabetes mellitus, a metabolic disorder, is becoming a serious threat to human health. During the past few years, many phytochemicals responsible for anti-diabetic effects have been isolated from plants. Alkaloids present in the leaves of M. koenigii have inhibitory effects on the aldose reductase enzyme systems for extending anti-diabetic effects M. koenigii was tested for the alpha- glucosidase inhibitory property and was found to inhibit alpha- glycosidase. Alpha-glucosidase inhibitors are widely used in the treatment of patients with type 2 diabetes. A study reported that an ethanolic extract of M. koenigii showed a significant reduction in blood glucose levels, and this effect of reducing blood glucose by M. koenigii is mediated by antioxidant properties and insulin mimetic effects. In addition, M. koenigii exhibited a profonud anti oxidant effect by reducing the malondialdehyde level, increasing the GSH level, and significantly decreasing the homeostatic model assessment insulin resistance index. On the whole, it is evident that M. koenigii possesses antidiabetic activity and has antioxidant effects in rats.

- **Wound healing effects:**

Wound healing is a complex and multi factors process involving numerous biochemical and cellular processes which helps in the restoration of functional and anatomical continuity M. koenigii leaves extend wound healing in male albino rats through significantly increased wound contraction and reduced epithelialization, supporting the collagen synthesis which was evident in histopathological studies.

- **Chemoprotective activity**

A methanolic extract of M. koenigii was demonstrated to render protection in chromosomal damage against radiation and cyclophosphamide in vivo. Radiation leads to a rise in all type of aberrations, like the fragmentation of chromatids and breakages in chromosomes, rings, and dicentrics. Treatment with a methanolic extract of M. koenigii before radiation significantly reduced the aberrations. M. koenigii can significantly exert bone marrow protection against radiation and cyclophosphamide.

- **Anti ulcer activity**

Anti ulcer activity was observed using aqueous extract at doses of 200 and 400mg/kg. it produced significant inhibition of gastric lesion induced by non-steroidal anti inflammatory drugs and pylorus ligation-induced ulcer. The extract reduced ulcerative lesion, gastric volume and free and total acidity but raised the pH value of gastric juice in pylorus ligation model. The results obtained suggested that the extract possess significant antiulcer activity.

- **Anti oxidant activity**

Addition of Murraya koenigii leaf powder in the high fat diet resulted in reduction of lipid peroxidation level to a beneficial extent. Carbazole alkaloids isolated from Murraya koenigii are recognized as sources natural antioxidants and thus play an important role in the chemoprevention of disease resulting from lipid peroxidation. Murraya koenigii leaf powder was decrease in the concentration pf malondialdehyde, while hydroperoxides and catalase in liver and heart. There was increased activity of Superoxide dismutase and catalase in liver and heart of administered groups. Oral feeding of 15% of powdered leaves of Murraya koenigii and 10% powder of seeds of Brassica juncea for a period of 60 days to streptozotocin diabetic rats showed the nephron protective effect. There was improvement in Serum glucose levels, body weight, urine volume, serum creatinine, and urinary albumin levels. Murraya koenigii can be best utilized by promoting as preferable food adjuvant fpr diabetic patients. Murraya koenigii treatment exerts a therapeutic protective nature in diabetes by decreasing oxidative stress and pancreatic beta-cell damage.

Anti diarrhoeal activity

Two bioactive carbozole alkoids, namely, kurryam and koenoimbine obtained from fractionated n-hexane extract of the seeds of M. koenigii exhibited significant inhibitory activity against castor oil-induced diarrhoea and prostaglandin.E2- induced enteropooling in rats. These compounds also produced a significant reduction in gastrointestinal motility in the charcoal meal test in wistar rats mahanimbine toxicity against the larvae of cules quinque fasciatus.

- **Anthelmintic activity**

Ethanolic and aqueous extracts from M. koenigii were investigated for their anthelmintic activity against pheretima posthuman. Both the extracts exhibited significant anthelmintic activity at concentration of 100 mg/ml. the alcoholic extracts produced more significant anthelmintic activity then petroleum ether extract.

- **Hepatoprotective activity**

The protective nature of M. Koenigii leaves extract was studied. The effect attributed to the combined effect of carbazole alkaloids Mahanimbine, Girinimbine, Isomahanimbine, murrayazolidine, Mahanine and ascorbic acid, alpha-tocopherol and mineral contents of M. Koenigii leaves extract. This study proved M. Koenigii a promising and rich source of free radical quenchers, which have been mediated through hepatocyte membrane stabilizing activity along with the reduction of fat metabolism. The normal morphology of cell was maintained after ethanolic challenge when aqueous extract containing tannins and carbazole alkaloids of M. Koenigii was given. Hepatoprotective activity was measured with respect to the different parameters studied and maintained normal morphology even after ethanolic challenge to the cell which was comparable to the protection offered by the standard drug L- ornithine-L-aspartate. The acetone extract of dried bark powder showed a prominent protection of liver cells as compared with the controlled group and other solvents in CCl4 – induced liver damage.

- **Anticancer activity**

Koenoline isolated form root bark exhibited cytotoxic activity against the KB cell culture test system. 9-formyl 3- methyl carbazole displayed with cytotoxic activity against both mouse melanoma B 16 and Adriamycin resistant P 388 mouse leukemia cell lines. The effect of extract M. Koenigii in vitro (short term incubation method) and in vivo (Daltons ascitic lymphoma [DAL] anticancer models have been evaluated in male Swiss albino mice. The anticarcinogenic potential of curry leaf used in benzo (a) pyrene induced fore stomach and 7, 12 dimethyl benz (a) anthracene (DMBA) induced skin papillomas was studied. Hemo protective responses were measured as decreased in tumor burden and % of tumor bearing c Transferase and DT- diaphoresis were also measured. Antioxidant parameters were also elevated. The in vitro anti tumour promoting activity and antioxidant properties of Girinimbine isolated from the stem bark of Murraya koeingii was studied.

- **Material and method**

Antioxidant properties of murraya koenigii (curry leaf).

- Plant material : fresh leaves of murraya koenigii were collected from healthy plants and identified botanically. The leaves were cleaned, shade-dried to maintain the integrity of phytochemicals, and ground to obtain a fine powder.
- Preparation of extracts : various solvent extracts were prepared using the powdered leaves through maceration or other suitable extraction methods.
- Determination of total phenolic content(TPC) :
  The folin ciocalteu method was employed to determine the total phenolic content in the M. koenigii extracts gallic acid was used as a standard, and the results were expressed as mg of gallic acid equivalents per gram of dry weight.
- Determination of total phenolic content:

The aluminium chloride colorimetric assay was used to measure the total flavonoid content in the extracts quercetin equivalents per gram of dry weight.

- Evaluation of antioxidant activity :

DDPH(2,2-azino-bis(3-etylbenzothiazoline -6-sulfonic acid) radical scavenging assay was also conducted to measure the antioxidant activity. Ferric reducing antioxidant power assay was used to evaluate the reducing power of the extract.

- **Conclusions**

The summarizes the medicinal uses, phytochemistry, and pharmacological properties of M. koenigii is a source of several bioactive compounds, including alkaloids, polyphenol, terpenoids, and flavonoids. M. koenigii and its derivatives appear to exhibits appreciable pharamacological activities, like anti-carcinogenic, immunomodulatory, and antioxidant properties. The molecular mechanisms underlying these activities of M. koenigii and derivatives are due to their diversified role in combinations of cell signaling pathways at multiple levels in various diseases. Also are limited by its bioavailability and in such conditions, enhancement of the efficiency should be conducted. It is very interesting to known the crude organic extract isolated from murraya koenigii leaves, fruits and stem pharmacological activity. They have exhibited lipid lowering, antidiabetic, anti diarrhoeal, antioxidant, anti microbial and aging properties.

- **References**

1 handral H.K., pandith A., shruthi S. D. A review on murraya Koenigii multipotential medicinal plant. Asian J. pharm. Clin. Res. 2012;2;5:5-14.

2 Saha c,Chowdhury BK. Carbazoloquinones from murraya koenigii, phytochemistry. 1998 48(2): 363-366

3 ningappa M.B.., Dhananjaya B.L., dienesha R., Harsha R., Srinivas L. Potent antibacterial property of APC protein from curry leaves (murraya koenigii) food chem. 2010;118:747-750.

4 tripathi Y. anjum N., Rana A. chemical composition and in vitro antifungal and anti oxidant activities of essential oil from murraya koenigii leaves. Asian J. biomed. Pharm. Sci.2018;8:6-13 diol:.

5 mittal J. curry leaf (murraya koenigii) a spice with medicinal property. MOJ boil.med.

6 paul S.., Bandyopadhyay T.K., bhattacharayya A. immunomodulatory effect of leaf extract of murraya koenigii in diabetic mice. Immunopharacol. Immunotoxicol.

7 dheeraj k. gahlawat, Savita Jakhar and pushpa Dahiya, murraya koenigii spreng an ethnobotanical,phytochemical and pharamacological review, journal of pharamacognosy

8 mandal S, nayak A, Kar M. Banerjee SK, Das A. Upadhyay SN et.al. antidiarrhoeal activity of carbazole alkaloids from murraya koenigii spreng seeds.

9 (khan et al.., 1998) xie et al (2006) reported the hypoglycemic and hypolipidemic activity of murraya kpenigii in ob/ ob murraya 2(5):465.

10 https \\ conservatoryoffflowes.org\ bloom\ murraya koenigii.

11 tembhurne S.V., Sakarkar D.M. hypoglycemic effects of fruite juice of murraya koenigii in alloxan induced diabetic mice. Int . J . pharamtech res.2009;1:1589

12 khuntia TK, Panda DS. Evaluation of antibacterial, antifungal and anthelmintic activity of Murraya koenigii Spreng. Pharma Sci Monit 2011 2(2):105-110

13 Ordon, Ez, AAL., Gomez, JD., Vattuone, MA., Isla, MI. Antioxidant activities of Sechiumedule (Jacq.) Swart extract, Food Chem.2006 1(4): 97, 452-458.

14 Saini et al. A review on Curry leaves [Murraya koenigii]: Versatile Multipotential medicinal plant American Journal of phytomedicine and chemical therapeutics. 7(4): ISSN- 2321-2748 149.

15 Narsimha NS, Paradkar MV , Chitguppi VP. Structure of Mahanimbine and Koenimbine , Tetrahedron Left. 1968 53:5501-5504.

16 Bhattacharya P, Chowdhury BK. 2-Methoxy-3- Methyl Carbazole From Murraya koenigii, Indian J. Chem, 1984 Sect. B, 24 B (4):452.

17 Reisch Johannes, Adebajo Adeleke C, Aladesanmi Adetunji J, Adesina Kolawale S et.al. Chemotypes of Murraya koenigii Growing In Sri Lanka, Planta Med.1994 60(3) 295-29.

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