

A REVIEW ON *MURRAYA KOENIGII*:- A VERSATILE MULTI-POTENTIAL MEDICINAL PLANT

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ABSTRACT

Originating in India, *Murraya koenigii* is a multipurpose plant. Curry trees, or *M. koenigii*, are popular culinary plants whose leaves have been used for generations as a flavoring, garnish, or spice. These leaves improve the flavor and nutritional content of a variety of foods. Additionally, *M. koenigii* is linked to a wide range of therapeutic uses in several traditional medical systems, such as Ayurveda, Siddha, and Unani. Among other things, it can be used to treat skin diseases, hemorrhoids, vomiting, and respiratory problems. Different portions of the plant are important to different indigenous cultures. Its potential advantages, including antioxidant, anti-inflammatory, anticancer, hepatoprotective, immunomodulatory, antibacterial, and neuroprotective qualities, have been emphasized by pharmacological study. Burns, bruising, and skin rashes can all be treated topically using curry leaves. They can also help stop hair from turning gray too soon.

KEYWORDS: Curry leaves, Traditional medicine, Anti-inflammatory, Analgesic, Pharmacology.

INTRODUCTION

The Rutaceae family, which has 150 genera and 1600 species, includes curry leaf (*Murraya koenigii*).^[1] It is known to be native to South Asia, especially Bangladesh, India, and Sri Lanka.^[2] The first and fourth centuries AD saw the use of *Murraya koenigii*. The entire plant has been utilized historically and is thought to have stomachic and tonic qualities.^[3] In addition to Karuveppilai in Tamil, Mitha Neem in Hindi, and Surabhinimba in Sanskrit.^[4] Because of their intricate leaves, curry leaf plants can also be used as lovely shrubs and hedges.^[5] The green leaves of *M. koenigii* are used to heal

wounds, edema, piles, diarrhea, inflammation, itching, and fresh cuts. The roots act as a purifier. They are used to cure illnesses all throughout the body and are stimulating. Snake bites can be healed with the bark.^[6-9] The extracted essential oil from *M. Koenigii* leaves contain hepatoprotective and antioxidant properties.^[10-13] Most people take herbal medications because they are thought to be safe, effective, and affordable. *Murraya Koenigii*, also known as Curry Leaves, Kadhi Patta, Mitha Nimba, and Giri Nimba, is a valuable medicinal herb that is frequently used as a spice, culinary additive, and treatment for many illnesses. Owing to its subtle taste, it is frequently used in Indian cuisine and is confidently employed in regular cooking. Curry leaves are a great source of nicotinic acid, vitamins B, C, A, and E, antioxidants, plant sterols, glycosides, and flavonoids in addition to carbohydrates, proteins, fiber, calcium, phosphorus, iron, magnesium, and copper.^[14] *Murraya Koenigii* has a variety of biological activities, such as effects on the heart.^[24] antiulcer activity.^[25] treatment for Alzheimer's illness.^[26] anti- diarrheal properties.^[27] chemoprotective activity.^[28] wound healing impact.^[29] anti- inflammatory and analgesic action.^[30]

❖ **Plant Profile**

❖ **Biological Source**

Leaves of the curry tree, *Murraya koenigii* or *Bergera koenigii*, is a tropical to sub- tropical tree.^[15]

❖ **Synonym^[33]**

Curry leaf, Mitha Neem, Karuveppilei

❖ **Images^[31]**



Fig. no. 1: *Murraya koenigii* (Curry leaves plant).

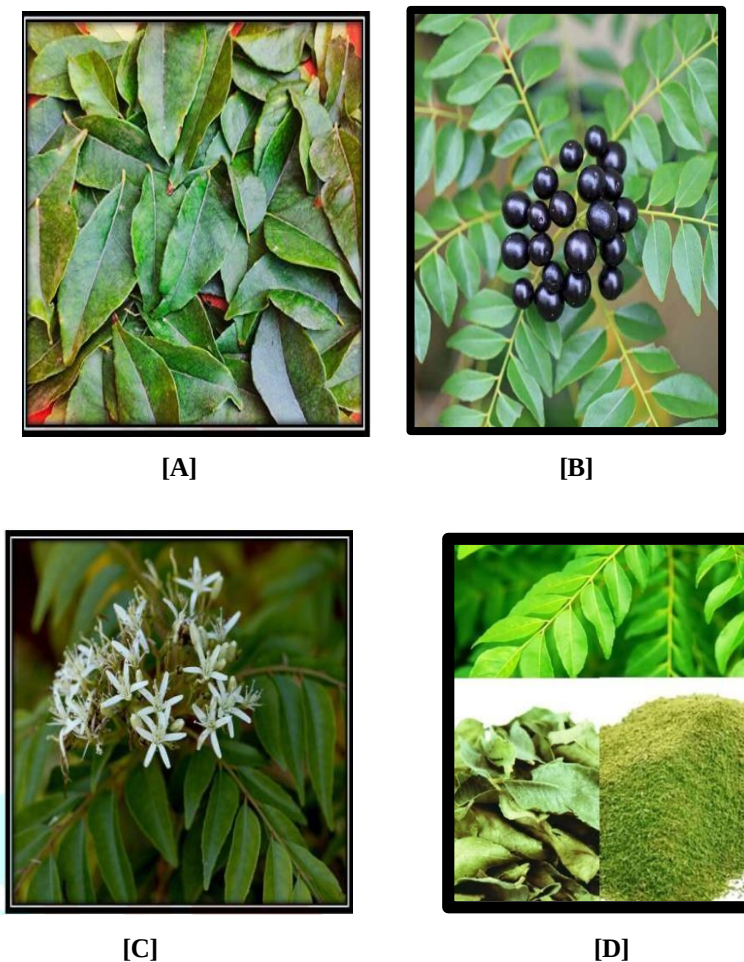


Fig. no. 2: A. Leaf B. Seed C. Flower D. leaves powder.

MORPHOLOGY

A 30-cm-long, bidirectional compound leaf with a reticulate vein has 24 lance-shaped leaflets that are 4.9 cm long, 1.8 cm wide, and have a petiole that is 0.5 cm long. This little spreading shrub has a main stem that is 16 cm in diameter. The white wood beneath the bark can be exposed by peeling it off lengthwise.^[22]

❖ Taxonomical Classification.^[34-37]

- Kingdom-*Plantae*
- Subkingdom- *Tracheobionta*
- Superdivision- *Spermatophyta*
- Division- *Magnoliophyta*
- Class- *Magnoliopsida*
- Subclass - *Rosidae*
- Family- *Rutaceae*
- Genus- *Murraya J. Koenig ex L.*
- Species- *Murraya koenigii (L.) Spreng*

❖ Botanical and Geographical Distribution

In India, *Murraya koenigii* is cultivated and sold. Sikkim, the Garhwal, Bengal, Assam, the Western Ghats, and the Travancore-Cochin regions are also home to it. Both full and partial shade allow the seeds to grow freely. In particular, Guangdong, South Yunnan, and South Hainan are home to these curry leaves. Wet forests, 500–1600 meters high. Thailand, Vietnam, Bhutan, Sri Lanka, Laos, and Nepal. Curry leaves migrate from South India to Malaysia, South Africa, and Reunion Island.^[23]

❖ Phytochemical Evaluation.^[32]

Table no. 1: Phytochemical Screening of *Murraya Koenigii*.

Sr. No.	Reagent	Alcohol Extract	Ether Extract	Microwave assisted extract
1. Detection of Alkaloids				
A.	Mayer's Test	-	-	-
B.	Wagner's Test	+	+	+
C.	Hager's Test	+	-	+
2. Detection of Carbohydrate				
A.	Molisch Test	+	+	+
B.	Fehling Test	+	+	+
C.	Benedict Test	-	-	-
D.	Barford's Test	+	+	-
3. Detection of Glycosides				
A.	Borntrager's Test	-	-	-
B.	Legal's Test	-	-	-
4.	Saponin	-	-	+
5. Detection of protein and amino acid				
A.	Millon's Test	+	+	+
B.	Nitric acid Test	-	+	+
C.	Biuret Test	-	-	+
D.	Ninhydrin Test	-	-	+
6. Detection of phenolic compound and tannins				
A.	Ferric chloride Test	+	+	+
B.	Gelatin Test	-	+	+
C.	Lead acetate Test	+	-	+
D.	Alkaline reagent Test	+	-	+

❖ Chemical Constituent

The mature curry leaves contain 63.2% moisture, 1.15% nitrogen protein, 14.6% total sugars, and 13.06% total ash. Curry leaves contain oxalic acid and resin. Bicyclomahanimbicine, cyclomahanimbicine, murrayastine, coumarine, koenidine, and pypayafolinecarbazole have notable pharmacological effects. Most volatile oil is composed of bicyclomahanimbicine and mahanimbicine¹⁰.^[16]

❖ Therapeutic Uses

1. Aromatic herbs are frequently used to flavor curries in order to enhance appetite and digestion.^[17]
2. Locally, leaves are used to cure exterior wounds, burns, rheumatism, and poisoning from animal bites.^[18]
3. To prevent vomiting, use roasted (cooked or crisped) leaves.^[19]
4. When consumed on an empty stomach, finely crushed leaves have laxative properties and help with gastrointestinal problems.^[20]
5. While fresh leaf juice combined with sugar and lime is used to treat morning sickness, drinking root juice relieves kidney pain.^[21]

❖ Advantages

1. By supplying vital nutrients that encourage skin regeneration and repair, *Murraya koenigii* aids skin health.
2. *Murraya koenigii* decreases blood levels of low-density lipoprotein (LDL), sometimes known as "bad" cholesterol.
3. Including *Murraya koenigii* in a well-balanced diet may therefore be a safe and efficient method to promote heart health.
4. By increasing metabolic efficiency and decreasing appetite, *Murraya koenigii* helps people lose weight.

❖ Review of Literature

1. Antihypertensive Activity

An isolated frog heart exhibits a dose-dependent positive inotropic response to an ethanolic extract of fresh *Murraya koenigii* leaves. The reaction to *Murraya koenigii* 62.5–1000 micrograms was unaffected by the use of sildenafil, propranolol, imidazole, or theophylline. The variations in sodium and potassium levels were unchanged. Murray The results suggest that *Koenigii* may have produced a favorable inotropic effect by increasing the quantity of calcium available from extracellular sources. Its high concentration of carbazole alkaloids is responsible for these activities.^[24]

2. Antiulcer Activity

Murraya koenigii aqueous and solvent ether extracts were tested for their antiulcer activities using a reserpine-induced stomach ulcer model in albino rats. These extracts may be just as protective as ranitidine and are useful in treating stomach ulcers. *Murraya koenigii* extract at a dose of 200–400 mg/kg considerably reduced stomach output. Its chemical components, especially carbazole alkaloids like koenimbine, koenine, and mahanin, are associated with these activities.^[25]

3. Anti-Alzheimer Activity

Memory significantly and dose-dependently improves after taking an ethanolic extract of *M. Koenigii* leaves for 15 days. A diet high in *M. koenigii* leaves significantly improved the memory scores of both young and old mice in a dose-dependent manner. It also significantly lessened the amnesia caused by scopolamine (0.4 mg/kg) and diazepam (1 mg/kg intraperitoneally). mg/kg, intraperitoneally), as shown by the results, which also showed a drop in brain cholinesterase activity and total cholesterol levels. Several chemical components, such as carbazole alkaloids like mahanimbine, girinimbine, and koeniline, are responsible for *M. Koenigii*'s action.^[26]

4. Anti-diarrhoeal Activity

The nhexane extract of *Murraya koenigii* plant seeds contains numerous important bioactive chemicals, including carbazole alkaloids, kurryam, koenimbine, and koenine. These substances have an inhibitory impact or activity against PGE2/prostaglandin-2 and castor oil-induced diarrhea in rats. According to the charcoal meal test, the material aids in reducing the gastrointestinal tract motility of Wister rats. *Murraya koenigii* extracts have been shown to exhibit these effects at oral doses of 100 mg/kg and 200 mg/kg of body weight.^[27]

5. Chemoprotective activity

In an albino rat, a single intraperitoneal dose of *M. koenigii* leaf methanol extract combined with 50 mg/kg of cyclophosphamide prior to administration reduced the drug's chromosomal damage and improved bone protection. Several chemical components, mainly carbszole alkaloids including mahanimbine, girinimbine, murrayazoline, and o-methylmurrayamine, are responsible for *M. koenigii*'s action.^[28]

6. Wound healing Activity

Murraya koenigii leaves have been shown to have wound-healing properties by reducing inflammation and encouraging the production of collagen. Furthermore, in male rat models of excision and incision wounds, the ethanol extract of its leaves demonstrated wound-healing activity. Carbazole alkaloids like mahanimbicine and mahanine, as well as its essential oil and other chemical constituents like flavonoids, phenolics, and terpenoids, are responsible for *M. koenigii*'s action.^[29]

7. Anti-inflammatory and analgesic Activity

When examined in rats using the carrageenan-induced paw oedema method, leaf ethanol extract, methanol extracts, and other extracts demonstrated strong anti-inflammatory and analgesic properties. Further research revealed that *M. koenigii* leaf extracts successfully lessen rats' pain following intraperitoneal acetic acid injection and subcutaneous formal injection. Ethanol extracts (at 300 and 400 mg/kg) have antihistamine qualities and can stabilize mast cells. Chemical components such as alkaloids, flavonoids, and triterpenoids are responsible for *M. koenigii*'s activity.^[30]

CONCLUSION

The Rutaceae family of green vegetables includes curry leaves. The plant's heart-healthy properties, ability to lower blood sugar and cholesterol, antibacterial, antiulcer, and antioxidant properties, as well as bacterial, cytotoxic, and antidiarrheal effects, are only a few of its many noteworthy pharmacological traits. There are several medical uses for almost every part of the plant. Proteins, fiber, carotene, vitamin B complex, and vitamin C are all abundant in the leaves. Its numerous pharmacological characteristics are attributed to the presence of monoterpene hydrocarbons, oxygenated monoterpenes, and sesquiterpenes, which are confirmed by a phytochemical profile investigation.

Future scope:-The future scope of curry leaves is substantial and growing, increasing global awareness of health benefits.

The future scope of *Murraya koenigii* in medicine is promising, with ongoing research and development focusing on its therapeutic potential. Here are some key areas of interest.

Natural Drug Development: *Murraya koenigii*'s rich phytochemical profile makes it a valuable resource for developing natural drugs against various diseases.

Pharmaceutical and Nutraceutical Applications: The plant's potential as a natural source of bioactive compounds for pharmaceutical and nutraceutical applications is being explored.

Pharmaceutical Delivery Systems: Recent advancements in drug delivery systems, such as nanoparticle formulations and phytosomes, are being investigated to enhance the therapeutic efficacy and stability of *Murraya koenigii*.

Radiotional Medicine: *Murraya koenigii*'s traditional uses in Ayurveda and other folk practices continue to be studied for their potential to provide health benefits.

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