

Murraya Koenigii (Curry Leave):A Systematic Review on It's Potential

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Abstract- The aim of this review study is to update information about pharmacognostical, Phytochemical and pharmacological studies of *Murraya koenigii*. To evaluate the versatile multi-potential medicinal use of *Murraya koenigii*. “Medicine is food and food is medicine” is the best way to describe on how the ailments were cured by using the plants during the ancient period of time. The “Magical plant of Indian Spice” (*Murraya koenigii*) has served humankind not only as food enhancer but also serve as village or folk medication to cure many disorders, the tribal communities has used many parts of the *Murraya koenigi*to cure them. The leaves and roots in different forms have great therapeutic potential and is used for the treatment of night blindness, dysentery, diarrhea, vomiting, bites of poisonous animals, bruises and eruption. Leaves are often used in curries for flavouring and seasoning due to their aromatic nature. The current review provides a detailed report of the importance of curry leaves, pharmacological activities, chemical constituents, morphological characteristics as well as up to date research study about *Murraya koenigii* leaves.

Keywords- *Murraya koenigii*, History, Phytochemistry, traditional medicine, Pharmacological activity, Medicinal Property.

I. INTRODUCTION

Murraya koenigii, commonly known as curry leaf or *kari patta* in Indian dialects, belonging to Family Rutaceae which represent more than 150 genera and 1600 species. *Murraya Koenigii* is a highly values plant for its characteristic aroma and medicinal value.^[2] A number of chemical constituents from every part of the plant have been extracted. The most important chemical constituents responsible for its intense characteristic aroma are Pgurjunene, P-caryophyllene, P-lemene and O-phellandrene. The plant is rich source for carbazole alkaloids.^[7]A number of chemical constituents from every part of the plant have been extracted. In recent years, greater attention has been paid to the use of *M. koenigii* in traditional medicines and home remedies. On the other hand, limited studies have been conducted for evaluating the pharmacological and medicinal efficacy of *M. koenigii* in

promoting health benefits and curing disease *Murraya koenigii* has diverse role in traditional medicine and is known for its stomachic properties. The leaves and roots in different forms have great therapeutic potential and is used for the treatment of night blindness, dysentery, diarrhoea, vomiting, bites of poisonous animals, bruises and eruption.^[3]

II. HISTORY

The history of curry leaves are seen in early 1st to 4th century AD. In Tamil and Kannada literature it was updated as word ‘kari’ with its uses. The word now popularly used for the *Murraya koenigii* is curry leaf which is originated from Tamil word Kari which means as ‘spiced sauce’.In the early literatures of Tamil and Kannada the use of *Murraya koenigii* is described as the flavouring agent for the vegetables.^[12]Today *Murraya koenigii* are grown as the cultivated crop in India, Sri Lanka, Southeast Asia, Australia, Pacific Islands and Africa as flavoring agent for the food.^[16]

Taxonomic Classification^[1,6]

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.

III. MORPHOLOGICAL CHARACTERISTICS

a. Stem

Murraya koenigii is more or less deciduous shrub or small tree reaching up to 6 m in height. The plant has a short trunk with 15-40 cm diameter. The main stem is dark green to brownish with numerous dots on it. Its bark can be peeled off longitudinally, exposing the white wood underneath.^[9,14]

b. Leaves

The leaves are bipinnately compound, 15-30 cm long, each bearing 11-25 leaflets alternate on rachis, 2.5-3.5 cm long ovate lanceolate with an oblique base. The leaf margins are irregularly serrate and petiole is 2-3 mm long.^[18]

c. Flowers

Round to oblong, 1.4 to 1.6 cm long, 1 to 1.2 cm in diameter, weight 880mg, volume 895 μ L, fully ripe fruits, black with a very shining surface.^[9]

d. Seed

The individual seed is 11 mm long, 8 mm in diameter and weights up to 445 mg.^[9,18]

e. Fruits

Fruits occur in close clusters. They are small ovoid or subglobose, glandular, with thin pericarp enclosing one or two seeds which are spinach green in colour. Fruits are 2.5cm long and 0.3 cm in diameter wrinkled with glands and turns purplish black after ripening; are edible and yields 0.76% of a yellow volatile oil.^[15,18]



Fig. I



Fig. II



Fig. III

Fig. 1: Morphology of *Murraya koenigii***Ethno botanical 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 cosmetics.^[4] Leaves are applied externally to bruises and eruption. The leaves and roots are bitter, acrid, cooling, anti-helminthic, analgesic, it cures piles, allays heat of the body, thirst, inflammation and itching. It is also useful in leucoderma and blood disorders. An infusion of the toasted leaves is used to stop vomiting.^[8]

Traditional Uses of *M. koenigii*

Essential oils and fresh leaf powder of *M. koenigii* are useful in seasoning food items and preparing ready-to-eat foods. Owing to the higher antimicrobial activities of the essential oil from leaf extracts^[7], this oil can also be used as perfume and flavor agents in traditional practice.

IV. 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%.^[2] 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, koenigin, resin, fresh leaves contain yellow color 2.5 % volatile oil. It also contains girinimbin, isomahanimbin, koenine, koenigine, koenidine and koenimbine. Mahanimbicine and bicyclomahanimbicine, phebalosin,

coumarine as Murrayone imperatoxin etc isolated from leaves.^[4]

V. PHARMACOLOGICAL ACTIVITY OF *MURRAYA KOENIGII*

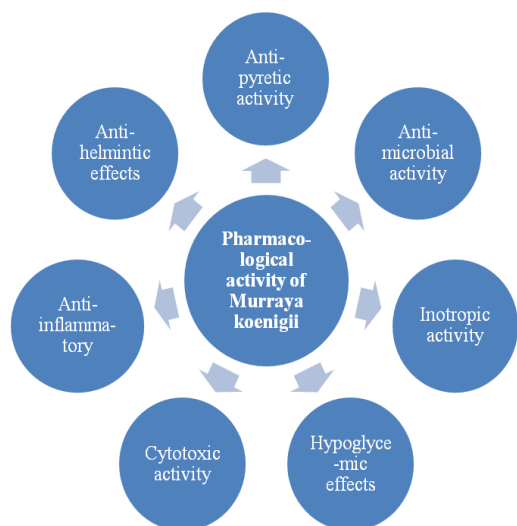


Fig. 2: Various Pharmacologic Activities of *Murraya Koenigii*

Antipyretic activity

The rats were fevered with the parental administration of 10mg/kg of brewer's yeast and were found that the ethanol extract of *Murraya koenigii* leaves poses an antipyretic activity compared to petroleum ether extract and chloroform extract, with paracetamol dose of 150mg/kg as a standard drug.^[13]

Antimicrobial activity

The hexane, methanol and chloroform extract of the *Murraya koenigii* root were tested against *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli*, *Salmonella typhi* and fungal strain of *Aspergillus niger*, *Candida albicans* and *Trichophyton rubrum*. The hexane, methanol and chloroform extract of the root of *Murraya koenigii* was effective on all the tested strains and methanol extract showed more significant antimicrobial activity compared to the others with maximum inhibitory effect on *Staphylococcus aureus* and *Trichophyton rubrum*. The *Staphylococcus aureus* were susceptible to the all the three extracts above, furthermore the aqueous extract of the root were found to be ineffective against the tested microorganism.^[1, 11]

Inotropic activity

The ethanolic extract of the fresh leaves of *Murraya koenigii* shows a positive inotropic effect on the isolated frog heart in a dose dependent manner. It was suggested that the positive inotropic activity is achieved by an increase in the availability of calcium from the extracellular sites by the *Murrayakoenigii*.^[17]

Antifungal Activity

The antifungal activity of *M. koenigii* has been reported in various studies. For example, the essential oil of the leaves was reported to possess antifungal activity^[18]. The antifungal activity of the leaves of *M. koenigii* is due to the presence of phytochemical constituents of complex molecular structures and diverse action mechanisms, 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 diarrhea, dysentery, and skin eruptions in folklore medicines^[19]. Bioactive compounds of *M. koenigii* appreciably hold the ability of mycelial growth inhibition and thereby promote antifungal activity.

Anthelmintic activity

Ethanolic and aqueous extracts from *Murraya koenigii* leaves were investigated for their anthelmintic activity against *Pheretima posthuma*. Both the extracts exhibited significant anthelmintic activity at concentration of 100 mg/mL. The alcoholic extract produced more significant anthelmintic activity than petroleum ether extract.^[2]

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 *Murrayakoenigii* (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^[4].

VI. CONCLUSION

Murraya koenigii is a multipotential medicinal plant. Almost each and every part of the plant has numerous medical applications. Thus it can be considered being a most suitable candidate for new drug discovery. The various pharmacological activities of the plant have been seen such as

such as activity on Anti diabetic, cholesterol reducing property, antimicrobial activity, antiulcer activity, Antioxidative property, cytotoxic activity, anti-diarrhoea activity, anti-cancer activity with many other phagocytic activity. The current review summarizes the medicinal uses, phytochemistry, and pharmacological properties of *M. koenigii*. *M. koenigii* is a source of several bioactive compounds, including alkaloids, polyphenol, terpenoids, and flavonoids. *M. koenigii* and its derivatives appear to exhibit appreciable pharmacological activities, like anticarcinogenic, proapoptotic, antiangiogenic, antimetastatic, immunomodulatory, and antioxidant properties.

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