

## ***Murraya koenigii* (Kadi Patta): A Charity of Ayurveda: A review**

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### **ABSTRACT**

*Murraya koenigii* is an herbal tree that is used for healthcare and medicinal fields from ancient times. It belongs to family Rutaceae (*M. koenigii*, Citrus, Berries (Triphasia and Citrus), Samaras (hop tree). The leaves, roots and stems of this plant has used for many purposes like in preparing juices, bringing aroma in many dishes. There are much potential of these plants because it is used for many diseases curing viz. anti-cancerous, antibacterial, antidiabetic, anti-diarrhea, and for memory enhancing. Their roots and leaves are taking for the cure from itching, inflammation, piles, etc. An evaluation can be performed to detect the phytochemical activity of *Murraya koenigii* in curing of diabetes, anemia and atherosclerosis and observing its influence in enhancing memory and hair growth. Mainly this plant has been researched on anti-diabetic, anemia and artherosclerosis. It showed best results and performed on pharmacological properties.

**Keywords:** *Murraya koenigii*, Phytochemical, Antimicrobial, Curry leaves

## **Introduction**

*Murraya Koenigii*, basically known as Curry Patta in india is widely used for seasoning in several tropical countries since era. *M. koenigii* is a sub-tropical tree in the family Rutaceae [1], which includes citrus, rue, which is native to Sri Lanka and India. Its leaves are generally used in many dishes in India, Sri Lanka, and many other countries [2]. It is a deciduous shrub up to a height of 5 meters to 6 meters and a 15 cm to 40 cm diameter in the Himalayan belts. The leaves are bipinnately compound. Margins irregularly created, petioles 2 mm to 3 mm long, flowers are bisexual, and it is a hardy crop. In high temperature, it can easily tolerate but when the temperature falls below 16°C the vegetative buds become highly expresses and arresting the new growth of the plant [3,4]. The leaves of *Murraya koenigii* is used in many of the Indian Ayurveda and Unani suggestion and prescriptions and play a flexible role in traditional medicinal cure [2]. Compounds such as carbohydrates, proteins, enzymes, fats, oils, terpenoids, flavonoids, sterols simple phenolic compounds, etc. The roots and barks of *Murraya koenigii* are used as a stimulant and it's applied for the cure of the external eruptions and the bites of poisonous animals [5]. Green leaves are taking raw for the cure of dysentery, diarrhea, and diabetes [6]. Curry leaf juice can be taken or ingested for treatment of renal diseases, Leaves and roots are taking for the cure and treatment of anthelmintic, analgesic, curing piles, inflammation, itching. The leaves can be taken for the treatment of fever by making tea [7].

## **Origin and Distribution**

*Murraya koenigii* (curry leaves) is belongs to the Rutaceae family and its native to India as well as Southeast Asian region [8]. In the early Tamil literature 1<sup>st</sup> to 14<sup>th</sup> AD centuries *Murraya koenigii* described as flavouring agent. *Murraya koenigii* distributed in Bangladesh, Malaysia, South Africa and Reunion Islands [9]. In India except the Himalayas curry leaves distributed all over Indian Subcontinent, In India curry leaves shared the land in Sikkim to Garhwali, Bengal, Western Ghats Kerala and Assam .Out of the 14 species two species are commonly found in India and that is *Murraya kenigiii* (L.) spreng and *Murraya paniculata* (L.) jack [10].

## **Phytochemicals**

Phenolics, saponins, terpenoids, flavonoid, tannins, alkaloids, phenolic acids, elagic acids, tannic acids etc.

## Traditional Uses

Curry tree leaves is prominently used as main and crucial ingredient in preparation of thoran, rasam, vada and Kadhi (well known traditional dishes of Eastern Asia). The wrenched out oil of *Murraya koenigii* well known to be used in preparation of scented soaps [11]. Its leaves are used to cool down the internal heat of stomach and to build up the digestive immunity. Paste of the leaves prepared can be used as an antidote against some venomous animals' bite [12]. The blend of extraction of curry tree leaf and bark are very helpful in maintaining hair growth. It can be the best alternate of antipyretic drugs. Intake if curry leaves extract reduces the destruction of b-cells of islets thus reduces or preventing the development of diabetes mellitus which is a malignant disease [13]. It is found that *M. koenigii* is helpful in maintaining skin pigmentation, control cholesterol level and enhance memory. It decreases the risk of calcium deficiency and gave strength to bone. It is observed that it also responsible for good dental health because it reduces the effect oral bacterial infection and used in tooth paste also for dental care [14].

## Pharmacological Properties

### Anti-diabetic activity

A chemical constituent of mahanimbine *M. koenigii* has been isolated from the column chromatography of dried plant petroleum ether sample. Anti-diabetic activity was conducted on the streptozotocin induced wistar rats with 50 mg/kg and 100 mg/kg dose of pure compound [15-16]. The potential mechanism by which the mahanimbine reduces the amount of blood sugar level could be by potentiating of insulin effect either by increasing the pancreatic secretion of insulin from beta cells of islets of langerhans or by increasing the peripheral glucose uptake. Mahanimbine demonstrated a strong inhibitory activity of alpha amylase relative to acarbose.

### Antiamnesic activity

*M. koenigii* leaves extract demonstrated by increased performance of animals in the learning tests, this leave extract mat be said to boost learning capabilities of aged mice in hypoxic condition [17]. The finding of the cholinesterase assay revealed that petroleum ether 300 mg/kg and 500 mg/kg extract of *M. Koenigii* extract are treated for 15 days. This leaf extract of leaves remarkably decrease the activity of brain cholinesterase. The norm, donepezil 0.5 mg/kg, decreased the activity of cholinesterases further.

### Nephroprotective activity

*Murraya koenigii* was used as a nephroprotective agent in a diabetic-induce animal model (rat). This leaf extract was shown to be helpful in preserving normal levels of serum creatinine, urinary creatinine, blood urea nitrogen, serum Na<sup>+</sup>, urine output, urinary urea, total urinary protein, urinary Na<sup>+</sup>, and total serum protein. In comparison, the *M. koenigii* extract preserved the normal trend in in-vivo antioxidants [18], histopathology of kidneys against unilateral renal ischemia reperfusion injury and renal Myeloperoxidase (MPO) activity.

### Chemoprotective activity

Methanolic extract from *M. koenigii* was has been shown to protect against radiation and cyclophosphamide *in vivo*. Radiation leads to a spike in all sort of aberrations, such as divergence chromatids and breakages in chromosomes, dicentric and rings [19]. Treatment with an extract of methanol from *M. koenigii* greatly decreases the aberrations. *M. koenigii* can greatly protect the bone marrow from radiation and cyclophosphamide.

### Memory enhancing

It was observed that ethanolic extract from the leaves lowered serum cholesterol in mice, obstruct brain acetyl cholinesterase enzyme and by which elevated the acetylcholine concentration in brain homogenate and eventually enhance the memory in elderly mice [20]. The plant extract was used in two different concentrations, 300 mg/ml and 400 mg/ml. Therefore, a combination of anticholinesterase and cholesterol lowering effect exhibited by leaves extract may be the factors responsible for this memory enhancing effect observed in the study.

### Antimicrobial activity

Benzoisofuranone derivatives along with three known steroids and six known carbazole alkaloids were isolated from stem bark of *Murraya Koenigii*. These compounds are stable at concentration between 3.13 µg/ml-100 µg/ml. Methanolic extract of 21 plant species were screened for *in vitro* anti-bacterial activity against multi resistant bacteria isolates including gram positive and gram negative strains [21]. *Koenigii* shown overall anti-bacterial activity revealed by literature study.

## Conclusion

Here in this plant showed the best results for control of anemia diseases, atherosclerosis and diabetic disease. Especially anemia is drastic condition in which reduction in the RBCS takes place in the blood which further causes reduction in level of oxygen supplied in blood. Every year 10 million cases persist every year in India. Diabetes is fatal ailment in which malfunctioning or no insulin produces inside the body by the pancreas which ultimately leads to the elevation of glucose in blood. Around 65 million individuals have diagnosed in India in 2016. Atherosclerosis refers to the stick of fats and cholesterol in arteries and veins causes hindrances in blood flow through the arteries.

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