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# CURRY LEAVES (*Murraya koenigii* Linn. Sprengal)- A MIRCALE PLANT

**SUMAN SINGH[a1], P.K.OMRE[B] AND SANDHYA MADAN MOHAN[c]**

[a] Head and A.P. Dept. of Home Science, Bhilai Mahila Mahavidyalaya, Bhilai
[b] Prof and Senior research officer, GB Panth uni. of research and tech., Pantnagar
[c] Research scholar, Dept. of process and food Engg., College of tech., Pantanagar

## ABSTRACT

**Curry leaves, an inevitable part of spicing up dishes are not a part of mere garnishing. They are rich in medicinal, nutraceutical properties and have even cosmetic uses. But from the age old days it is customary to pick up curry leaves from dishes and throw it out first before even tasting it.Mustard seeds sizzling in hot oil...into it go chopped onion and curry leaf... "ssssshh"... No curry in South India is complete without this step. Indian cuisine experts, especially in South India made it a habit to include curry leaves in our daily diet. More than adding to the multi-hued look and spicy taste, there was definitely some other reason why the wise Indian ladies included curry leaf a necessary ingredient in all our dishes. Though it is customary to remove these deep green leaves from dishes we are truly unaware of its health benefits. In this article we are exploring curry leaf health benefits besides the taste in our daily life.**

**Key Words**: Nutraceutical Properties, Ingredient, Health Benefits.

Curry leaves are a popular leaf-spice used in very small quantities for their distinct aroma due to the presence of volatile oil and their ability to improve digestion. “Let food be your medicine and let medicine be your food.” Herbal and natural products of folk medicine have been used for centuries in every culture throughout the world. Scientists and medical professionals have shown increased interest in this field as they recognize the true health benefits of these remedies. The important advantages claimed for therapeutic uses of medicinal plants in various ailments are their safety besides being economical, effective and their easy availability. Curry leaf (Murraya koenigii) is an important leafy vegetable. Its leaves are widely used in Indian cookery for flavouring foodstuffs. The leaves have a slightly pungent, bitter and feebly acidic taste, and they retain their flavour and other qualities even after drying. Curry leaf is also used in many of the Indian ayurvedic and unani prescriptions.

## HISTORY OF CURRY LEAVES

The curry leaf tree is native to India, Sri Lanka, Bangladesh and the Andaman Islands. Later spread by Indian migrants, they now grow in other areas of the world where Indian immigrants settled. Widely cultivated, the leaves are particularly associated with South Indian cuisines.

### Origins

Curry leaf trees are naturalised in forests and waste land throughout the Indian subcontinent except in the higher parts of the Himalayas. From the Ravi River in Pakistan its distribution extends eastwards towards Assam in India and Chittagong in Bangladesh, and southwards to Tamil Nadu in India. The plants were spread to Malaysia, South Africa and Réunion Island with South Asian immigrants.

### History

The use of curry leaves as a flavouring for vegetables is described in early Tamil literature dating back to the 1st to 4th centuries AD. Its use is also mentioned a few centuries later in Kannada literature. Curry leaves are still closely associated with South India where the word 'curry' originates from the Tamil 'kari' for spiced sauces. An alternative name for curry leaf throughout India is kari-pattha. Today curry leaves are cultivated in India, Sri Lanka, Southeast Asia, Australia, the Pacific Islands and in Africa as a food flavouring.

### Cultivation and collection

Flowering starts from the middle of April and ends in the middle of May. The peak flowering season under the Sanwara (H.P.) conditions was observed to be the last week of April. The fruiting season was observed to continue from the middle of July to the end of August. The peak fruiting

1Corresponding author

season, however, was found to continue from the last week of July to the 1st week of August. Curry leaf is Native to India. Large shrub to small tree. Pinnate leaves are used in many South Indian curries. Full sun or light shade. Fertilize with palm or citrus fertilizer to promote leaf production. Grows well in containers. Use a well drained potting mix. Can be grown outdoors in Southern California, South Texas and South Florida. Protect from freezing. Seeds are fragile so handle with care. Seeds are shipped in moist peatmoss/coir mix and should be planted immediately.

**Classification**

**Scientific Classification**

| | |
|---|---|
| Kingdom Plantae – Plants | |
| Subkingdom Tracheobionta – | Vascular plants |
| Superdivision Spermatophyta – | Seed plants |
| Division Magnoliophyta – | Flowering plants |
| Class Magnoliopsida – | Dicotyledons |
| Subclass Rosidae- | Order Sapindales |
| Family Rutaceae – | Rue family |
| Genus Murraya J. Koenig ex L. – | murraya |
| Species Murrayakoenigii (L.) Spreng. – curry leaf tree | |

## Morphological characters

A small spreading shrub, about 2.5 metres high; the main stem, dark green to brownish, with numerous dots on it; its bark can be peeled off longitudinally, exposing the white wood underneath; the girth of the main stem is 16 cm. 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 petiole. Flowers, bisexual, white, funnel-shaped, sweetly scented, stalked, complete, ebracteate, regular, actinomorphic, pentamerous, hypogynous, the average diameter of a fully opened flower being 1.12 cm; inflorescence, a terminal cyme, each bearing 60 to 90 flowers; calyx, 5-lobed, persistent, inferior, green; corolla, white, polypetalous, inferior, with 5 petals, lanceolate; length, 5 mm; androecium, polyandrous, inferior, with 10 stamens, dorsifixed, arranged into circles of five each; smaller stamens, 4 mm. long whereas the longer ones, 5 to 6 mm; gynoecium, 5 to 6 mm long; stigma, bright, sticky; style, short; ovary, superior.

Fruits, round to oblong, 1.4 to 1.6 cm long, 1 to 1.2 cm in diameter; weight, 880 mg; volume, 895 microlitres; fully ripe fruits, black with a very shining surface; pulp, Wistaria blue 640/2; the number of fruits per cluster varying from 32 to 80. Seed, one in each fruit, 11 mm long, 8 mm in diameter, colour spinach green 0960/3; weight, 445 mg; volume, 460 microlitres.(4)

**Main component responsible for flavour**

The major constituent responsible for the aroma and flavor has been reported as pinene, sabinene, caryophyllene, cadinol and cadinene . Essential oils from M. koenigii

serves as an important part in soap making ingredients, lotions, massage oils, diffusers, potpourri, scent, air fresheners, body fragrance, perfume oils, aromatherapy products, bath oils, towel scenting, spa's, incense, facial steams, hair treatments, and more . There are several methods to extract essential oil from herb and spices like steam distillation, hydrodistillation, and solvent extraction but this study focus on a new, applicable method of essential oil extraction that is ultrasonic-assisted solvent extraction method. This extraction method is a combination of solvent extraction and ultrasonic extraction method. The steps required for the preparation of the material prior to extraction (including aspects concerning plant selection,

collection, identification, drying, grinding and weighing) and analyzing method for the essential oil composition are detailed.

| | |
|---|---|
| Specific gravity (25□C) | 0.9748 |
| Refractive index (25□C) | 1.5021 |
| Optical rotation (25□C) | + 4.8 [6] |
| Saponification value | 5.2 |
| Saponification value after after acetylation | 54.6 |
| Moisture | 66.3% |
| Protein | 6.1% |
| Fat (ether extract) | 1.0% |
| Carbohydrate | 18.7% |
| Fibre | 6.4% |
| Mineral matter | 4.2% |
| Calcium | 810 mg/100 g of edible portion |
| Phosphorus | 600 mg/100 g of edible portion |
| Iron | 3.1 mg/100 g of edible portion |
| Carotene (as vitamin A) | 12 600 IU/100 g |
| Nicotinic acid | 2.3 mg/100 g |
| Vitamin C | 4 mg/100 g |
| Thiamine and riboflavin | Absent |

**Different form of curry leaves spiced our daily lives**

While there are many different kinds of curry powders and curry dishes throughout the world, curry leaves come from only one type of tree, the curry leaf tree. However, curry leaves can come in four different forms: fresh, dried, powdered and cooked.

**Fresh**

Fresh curry leaves are the preferred form for cooking. Fresh leaves may be used directly after harvesting from a curry leaf tree. They also may be placed or vacuum-packed in plastic bags and refrigerated or frozen after harvesting, which keeps them fresh from one week to two months. Fresh curry leaves are generally found in the freezer section of stores.

**Dried**

Curry leaves may be air dried or oven dried, producing leaves that have a longer shelf life. According to Gernot Katzer's Spice Pages, some recipes require the baking or toasting of fresh curry leaves before the leaves are added as a flavoring. Dried leaves are also available commercially.

**Powdered**

Powdered curry leaves are also called for in some recipes and powdered curry is also available commercially. After being dried, curry leaves can be pulverized, producing a concentrated powder. Powdered curry leaves, though, should not be confused with curry powder. Commercial curry powder is usually a mixture of many spices, while powdered curry leaf is a powdered version of the actual dried curry leaf. It is important to read spice labels for accuracy prior to purchase.

**Cooked**

Sautéed or fried curry leaves are prepared by the cook or chef prior to or during the cooking process. Some recipes require that fresh curry leaves be cooked before being added as flavouring. Such sautéed or fried curry leaves would not generally be purchased in advance. Instead, curry leaves would be purchased fresh, or perhaps dried, and then cooked in the kitchen.

**Fig. 1 Curry Leaf Powder in Spices**

**Fig. 2 Curry Leaf Plant**

**Table 1-Comparative nutrient content of fresh and dehydrated curry leaves**

| **Nutrients** | **Value of fresh curry Leaves (100g)** | **Value of dehydrated Curry leaves (100g)** |
|---|---|---|
| Protein | 6g | 12g |
| Fat | 1g | 5.4g |
| Carbohydrate | 18.7g | 64.31g |
| Calcium | 830mg | 2040mg |
| Iron | 0.93mg | 12mg |
| B-carotene | 7560µg | 5292µg |

**Source**-Indian Journal of Natural Products and Resources Vol. 2(4), December 2011, pp. 508-511

**Traditional uses**

The bark and the roots are used as a stimulant by the physicians. They are also used externally to cure eruptions and the bites of poisonous animals. The green leaves are stated to be eaten raw for curing dysentery, and the infusion of the washed leaves stops vomiting. Curry leaves are also used in calcium deficiency. It has Vitamin A, Vitamin B, Vitamin C, Vitamin B2, Calcium and iron in plenty. Its nutritional value benefits both the young and the old alike. Women who suffer from calcium deficiency, osteoporosis etc can find an ideal natural calcium supplement in curry leaves. Fresh juice of curry leaves, with lime juice and sugar, is an effective medicine in the treatment of morning sickness, nausea and vomiting due to indigestion and excessive use of Asian J. Pharm. Res. 2012; Vol. 2: Issue 2, Pg 51-53 [AJPRes.] 53 fats. One or two teaspoons of juice of these leaves mixed

With a teaspoon of lime juice may be taken in these conditions. The curry leaves, ground to a fine paste and mixed with buttermilk, can also be taken on an empty stomach with beneficial results in case of stomach upsets. Also used as laxative. Boils and similar eruptions appear on

Skin during summer. Most of the boils tend to subside over time, but some may persist and remain painful. Curry leaves come handy in treating such conditions. A paste made of curry leaves is applied on these persistent boils for quick

relief. Along with mint leaves and coriander leaves, curry leaves can be used in treating excessive pitta conditions. Curry leaves can be used with effective result to treat burn, bruises and skin erruption. Cataract development can be prevented by using fresh juice of curry leaves. Kidney pain can be cured by using juice of root of Murrayakoenigii. It can be used in preventing premature greying of hair.

**Pharmacological activity**

Curry leaves are rich in many minerals and trace minerals such as Iron, zinc and copper. Therefore, researchers recommended in a study published in January 2007 in "Chemico-Biological Interactions" that people with diabetes may benefit from the addition of curry leaves in the diet. minerals found in curry leaf extract are important for maintaining normoglycemia, or the normal glucose content of the blood. This is done by the activation of pancreatic beta cells, which are responsible for the creation of insulin. While the nutrients in curry account for only about 1 to 2 percent of the required daily intake for these elements, they are bioavailable, or readily usable by the body. Therefore, the researchers suggested that curry leaves may be useful for the management ofdiabetes

A scrutiny of literature reveals some notable pharmacological activities of the plant such as activity on heart, Anti diabetic and cholesterol reducing property, antimicrobial activity, antiulcer activity, antioxidative property, cytotoxic activity, anti diarrhea activity, phagocytic activity. (Syam, Suvitha *et al*., 2011)

The antioxidative properties of the leaves extracts of Murrayakoenigii using different solvents were evaluated based on the oil stability index. (Arulselvan P, *et al*., 2007)

M. koenigii possesses statistically significant hypoglycemic potential in STZ-induced diabetic rats. The M. koenigii extract appeared to be more effective than glibenclamide, a known antidiabetic drug. (Arulselvan, *et al*., 2006)

It also revealed hepato-protective activity against ethanol-induced hepatotoxicity. Chronic ethanol consumption diminishes the cellular antioxidant levels through free radical induced injury causing hepatitis and cirrhosis with mortality in severe cases. (Rupali Arun Patil, *et al*., 2012)

It also shows antibacterial activity against S. typhi and E.coli. (Jaju Shivkanya, *et al*., 2009)

Carbazole derivatives are well known for their various pharmacological activities, including anti-HIV, anticancer, antibacterial and antifungal activities. A series of substituted carbazoles, termed N-alkylated 3,6-dihalogenocarbazoles, that exhibit fungicidal activity against *C. albicans* and the emerging pathogen *Candida glabrata*. The most potent fungicidal compounds of this series were characterized *et al*., by minimal fungicidal concentration (MFC) between 8.5 and 25 μM. (Yukari Tachibana, *et al*., 2001)

## CONCLUSION

Curry leaves (*Murraya koenigii* ) is a leafy vegetable that belongs to the Rutaceae family. The various notable pharmacological activities of the plant such as activity on heart, Anti diabetic and cholesterol reducing property, antimicrobial activity, antiulcer activity, antioxidative property, cytotoxic activity, anti diarrhea activity, phagocytic activity. The chemical composition of the fresh leaves of Murrayakoenigii consists of volatile oil. Carbazole alkaloids and triterpene have been isolated from stem bark and roots of *Murraya koenigii*. Thus Curry leaves merits further phytochemical, pharmacological and clinical investigations for development of an effective natural remedy to provide therapeutically effective lead compounds.

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