

Research Article

A review on *Murraya koenigii* (Curry leaf plant): a Medicinal plant

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ABSTRACT

Medicinal plants have been playing an essential role in the development of human culture. As a source of medicine, Medicinal plants have always been at forefront virtually all cultures of civilizations. Medicinal plants are regarded as rich resources of traditional medicines and from these plants many of the modern medicines are produced. India is perhaps the largest producer of medicinal herbs and is rightly called the “Botanical garden of the World”. *Murraya koenigii* (L.) Spreng. belongs to the family Rutaceae have long been considered a premier leafy vegetable with attractive habit and graceful leaves. The plant is grown presently in the backyards of every South Indian home, but its nutritive value and medicinal properties have not been fully appreciated. The species is native to India and at present it is cultivated in Burma, Ceylon, China, Australia and Pacific Islands. It is used in fresh, dried and processed forms for flavoring food stuffs. It is extensively used in the indigenous system of medicine as an anti-diabetic agent. Further it is known to possess anti-inflammatory, anti-dysenteric, antioxidant and diverse pharmacological properties. The aim of the present review study is to update information about traditional system of medicine and phytochemical studies of *Murraya koenigii*.

Keywords- Medicinal plant, *Murraya koenigii*, Rutaceae

INTRODUCTION

Since the beginning of human civilization, medicinal plants have been used by mankind for its therapeutic value. Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural sources. Many of these isolations were based on the uses of the agents in traditional medicine. The plant-based, traditional medicine systems continues to play an essential role in health care, with about 80% of the world’s inhabitants relying mainly on traditional medicines for their primary health care (Owolabi et al., 2007).

Selection of scientific and systemic approach for the biological evaluation of herbal formulations based on their use in traditional system of medicine forms the basis for the ideal approach in the development of the new drugs from plants. India is frequently known by enormous biodiversity of medicinal plants. Among them *Murraya koenigii* have a lots of bioactive principles due to which plant has been proven as the medicinally important plant but least or no attention received by the scientist. *Murraya koenigii* is proven as the natural medicinal plant (Singh et al., 2014, Kong et al., 1986; Tee & Lim, 1991). Genus name honors Johann

Andreas Murray (1740-1791), Swedish pupil of Linnaeus and professor of medicine and botany, Gottingen. Hence the botanical name of the curry leaves is *Murraya koenigii* (Ajay et al., 2011). Of the 14th global species belonging to the genus *Murraya* (Rutaceae), only two are available in India, viz. *Murraya koenigii* Spreng and *Murraya paniculata* Linn. Jack (syn. with *M. exotica* Linn.).

Taxonomic status (Jain et al., 2017) -

- a. Kingdom - Plantae
- b. Sub-kingdom - Tracheobionta
- c. Superdivision - Spermatophyta
- d. Division - Magnoliophyta
- e. Class - Magnoliopsida
- f. Subclass - Rosidae
- g. Order - Sapindales
- h. Family - Rutaceae
- i. Genus - *Murraya* J. Koenig ex L
- j. Species - *Murraya koenigii* L. Spreng

It is found almost everywhere in the Indian subcontinent, it shares aromatic nature, more or less deciduous shrub or tree up to 6 m in height and 15-40 cm in diameter with short trunk, thin smooth grey or brown bark and dense shady crown (Mhaskar et al., 2000). The *M. koenigii* is having grey color bark, longitudinal striations on it and beneath it white bark is present. 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. Margins irregularly serrate, petioles 2-3 mm long, flowers are bisexual, white, funnel shaped sweetly scented, stalked, complete, ebracteate, regular with average diameter of fully opened flower being in average 1.12 cm inflorescence, terminal cymes each bearing 60-90 flowers. Fruits are ovoid to subglobose, wrinkled or rough with glands. It is having the size of 2.5 cm long and 0.3 cm in diameter and gets purplish black when ripen. Seeds generally occur in spinach green color, 11 mm long, 8 mm in diameter and weighs up to 445 mg (Prajapati et al., 2003). The aim of the present review study is to update information about traditional system of medicine and phytochemical studies of *Murraya koenigii*.

The former is more popular due to its large spectrum of medicinal properties and also because of the use of its leaves for centuries as a natural flavouring agent in various curries and food items (Nayak et al., 2010). In traditional system of medicine, the plant is regarded as analgesic, cooling, alexiteric, antiemetic, anthelmintic, antidiarrhoeal, febrifuge, carminative, purgative, stomachic and stimulant and used to alleviate body temperature, blood disorders, diarrhoea, dysentery, eruption, inflammation, itching, kidney pain, leukoderma, piles, snakebite, thirst, vomiting and blood purification. The leaves of the plant are used traditionally in the Indian Ayurveda system to treat diabetes (Rastogi & Mehrotra, 1980). Furthermore, use of essential oils in food processing and packaging represent a valid alternative to prevent auto-oxidation and prolong shelf life of food products (Amorati, 2013). Curry leaves are boiled with coconut oil till they are reduced to blanked residue which is then used as an excellent hair tonic for retaining natural hair tone and stimulating hair growth. It is traditionally used as a whole or in parts as antiemetics, antidiarrheal, febrifuge, blood purifier, antifungal, depressant, anti-inflammatory, body aches, for kidney pain and vomiting (Rao et al., 2011; Rana et al., 2004, Kumar et al., 1999; Purohit et al., 2009; Iyer & Mani, 1990; Nutan et al., 1998; Chakrabarty et al., 1997; Ponnusamy et al., 2010; Adebajo et al., 2004; Gandhi et al., 2010; Mandal et al., 2010; Ningappaa et al., 2010; Khuntia & Panda, 2011). This plant has been reported to have anti-oxidative, cytotoxic, antimicrobial, antibacterial, anti ulcer, positive isotropic and cholesterol reducing activities (Shah & Juvekar, 2006; Shrinivasan, 2005; Manfred et al., 1985; WHO, 2003; Ram et al., 2002; Khatik & Joshi, 2018; Kesari et al., 2005; Xie et al., 2006; Rahman & Gray, 2005). Some of them showed anti carcinogenic properties in a cultured human leukemia cell line (Roy et al., 2004; Ito et al., 2006). The presence of numerous valuable medicinal properties and other uses established its potential demand for export (Rao et al., 2007; Khatik & Joshi, 2018). Recent phytochemical studies have revealed the occurrences of a

Kunitz-type trypsin inhibitor in the seeds (Shee et al., 2007) and an antioxidant protein in leaves (Ningappa et al., 2008) of *M. koenigii*

Phytochemical investigations have led to the isolation and characterization of several chemical constituents from every part of the plant. The phyto-constituents present in *M. koenigii* leaves include phenols, steroids, saponins, quinones, alkaloids, flavonoids, tannins, carbohydrates, proteins, and volatile oils (Gupta et al., 2009). Leaf contains various phytoconstituents (Palanisamy et al., 2007; Chowdhury et al., 2008) such as carbazole alkaloids and phenolic compounds in rich amount both are responsible for antioxidant (Reach et al., 1992; Yukari et al., 2011) and many other activities of drug. Antioxidants are used in prevention of various diseases such as skin disease, cancer etc. Bark contains carbazole alkaloids namely mukoenine-A, B and C and murrastifoline-F, bis-2-hydroxy-3-methyl carbazole, bismahanine, bi koeniquinone-A, bismurrayaquinone-A, murrayacine, murrayazolidine, murrayazoline, mahanimbine, girinimbine, koenioline and xynthyletin (Rao et al., 2011). Leaves contains koenimbine, O-methyl murrayamine, O-methyl mahanine, isomahanine, bismahanine, bispyrayafoline, glycozoline, 1-formyl-3-methoxy-6-methyl carbazole, 6, 7-dimethoxy-1-hydroxy-3-methyl carbazole, koenigine, koenine, koenidine and (-) mahanine, mahanimbine, isomahanimbine, koenimbidine, murrayacine, Isomahanimbicine, euchrestine B, mahanine, mahanimbicine, mahanimbine, bismurrayafoline E, mahanimbicine, bicyclomahanimbicine, cyclomahanimbine, bicyclomahanimbine, mahanimbidine, mukonicine, 1-formyl-3-methoxy-6-methyl carbazole and 6, 7-dimethoxy-1-hydroxy-3-methyl carbazole (Chowdhury et al., 2001; Tachibana et al., 2003; Bonde et al., 2011; Gahlawat et al., 2014). The leaves of *Murraya koenigii* also consist of protein, carbohydrates, fibre, minerals, carotene, vitamin C, Nicotinic acid (Gahlawat et al., 2014). Bioactive carbazole alkaloids including murrayanol, murrayagetin, marmesin-1''-Orutinoside, mukoline, mukolidine, girinimbine and koenoline from roots; mahanimbine,

koenimbine, isomahanine murrayanol, mahanimbine, murrayazolidine, girinimbine, koenimbine and mahanine from fruits and iskurryam, koenimbine, koenine, mahanimbine, girinimbine, koenimbine, mahanine and isomahanine alongwith indicolactone, anisoalctone and 2,3-epoxyindicolactone and minor furocoumarins such as xanthotoxin, isobyaknagelicol, byakangelicol, isogosferol, isoheraclenin, isoimperatonin, oxypeucedanin, isopimpinellin and bergaptanwere have been extracted from the seeds (Singh et al., 2014). The most important chemical constituents responsible for its intense characteristic aroma are p-gurjunene, p-caryophyllene, p-elemene and o-phellandrene (Shah et al., 2008). 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 and hair treatments (Shruthi et al., 2012; Rana et al., 2004).

CONCLUSION

Medicinal plants are resources of new drugs and many of the modern medicines are produced indirectly from plants. Curry leaves can use to produce many economically valuable products in South Asia which are in high nourishment and healthy diet. The chemical composition of the fresh leaves of *Murraya koenigii* 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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