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GC-MS analysis of the Curry leaves *(Murraya koengii)*

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Abstract

Medicinal plants and their bioactive compounds have been utilized for primary and traditional healthcare system since time immemorial. The leaves of *Murraya koenigii* are used as a herbs in Ayurvedic medicine. They are believed to possess anti-diabetic, anti microbial, anti inflammatory properties. *Murraya koenigii* is a medicinal herb traditionally also used in the treatment of piles, itching and are useful in leucoderma and blood disorders. The methanolic extract of the leaves of *Murraya koenigii* was analyzed by gas chromatography-mass spectrometry (GC-MS). Five compounds were identified which included α.-Caryophyllene, 2-phenyl-4-quinolinecarboxamide and Phenanthrene. In this article we outline about pharmacological and biological activities of these compounds.

Keywords: *Murraya koenigii;* leaves; α.-Caryophyllene; 2-phenyl-4-quinolinecarboxamide, Phenanthrene.

1. Introduction

Murraya koenigii, commonly known as curry leaf or kari patta in Indian dialects, belonging to Family Rutaceae which represents more than 150 genera and 1600 species (1). *Murraya koenigii* is distributed from south and East Asia to Australia. Murraya Koenigii is a highly values plant for its characteristic aroma and medicinal value. *M. koenigii* is widely used in Indian cookery for centuries and *have been utilized by developing countries for primary and traditional healthcare system. In several ancient systems of medicine Murraya koenigii, a medicinally important herb has wide therapeutic applications such as in bronchial abnormalities, piles, vomiting, skin infections etc. The medicinal values have been observed especially for leaf, stem, bark and oil.* The plant has tonic and stomachic properties. Bark and roots of *Murraya koenigii* can be used as stimulant and to cure eruptions and bites of poisonous animals. The tender green leaves are also having medicinal importance for cure of dysentery, diarrhoea and checking vomiting. Leaves and roots are also used as bitter, anthelmintic, analgesic, curing piles, inflammation; itching and they are useful in leucoderma and blood disorders (2, 3). According to several systematic scientific studies which are conducted regarding the efficacy of whole plant or its parts in different extract forms for various medicinal values, *M. koenigii* contains a good number of chemical constituents which exhibit their pharmaco dynamic response. The active constituents are responsible for the medicinal properties have been isolated and characterized. Based on earlier data this plant has been reported to have anti-oxidative, antimicrobial, anti ulcer, and cholesterol reducing activities (4-10). The present communication deals with the GC-MS analysis of the methanolic extract of the leaves of *Murraya koenigii*.

2. Experimental Section

2.1. Extraction of Plant Material

Plant material (leaves, 20 Gms) was extracted with 250 mL of methanol at 60^{o}C for 8hrs in Soxhlet extractor. The methanolic extracts were filtered through Whatmann No. 1 filter paper. The filtrate was evaporated to dryness at 80^{o}C and stored until further analysis.

2.2. Preparation of Stock Solution:

The extracts were reconstituted in methanol. Methanolic extracts (1 µl) were injected for GC-MS analysis.

2.3. Gas Chromatography-Mass Spectrometry

The methanolic extract of the leaves of *Murraya koengii* was subjected to GC-MS analysis on a GC- MS Clarus 500 Perkin Elmer system comprising a AOC- 20i autosampler and gas chromatograph interfaced to a mass spectrometer (GC-MS) instrument employing the following conditions: column Elite-1 fused silica capillary column (30mm x 0.25mm ID x 1 µMdf, composed of 100 % Dimethyl poly siloxane), operating in electron impact mode at 70 eV; helium (99. 999%) was used as carrier gas at a constant flow of 1ml/min and an injection volume of 0.5 µl was employed (split ratio of 10:1); injector temperature 250 °C. The oven temperature was programmed from 110 °C (isothermal for 2 min), with an increase of 10 °C/min, to 200 °C, then 5 °C / min to 280 °C, ending with a 9 min isothermal at 280 °C. Mass spectra were taken at 70 eV; a scan interval of 0.5 seconds and fragments from 40 to 550 Da. The mass spectra of the separated components were compared with those stored in the NIST database (NIST version 2.1).

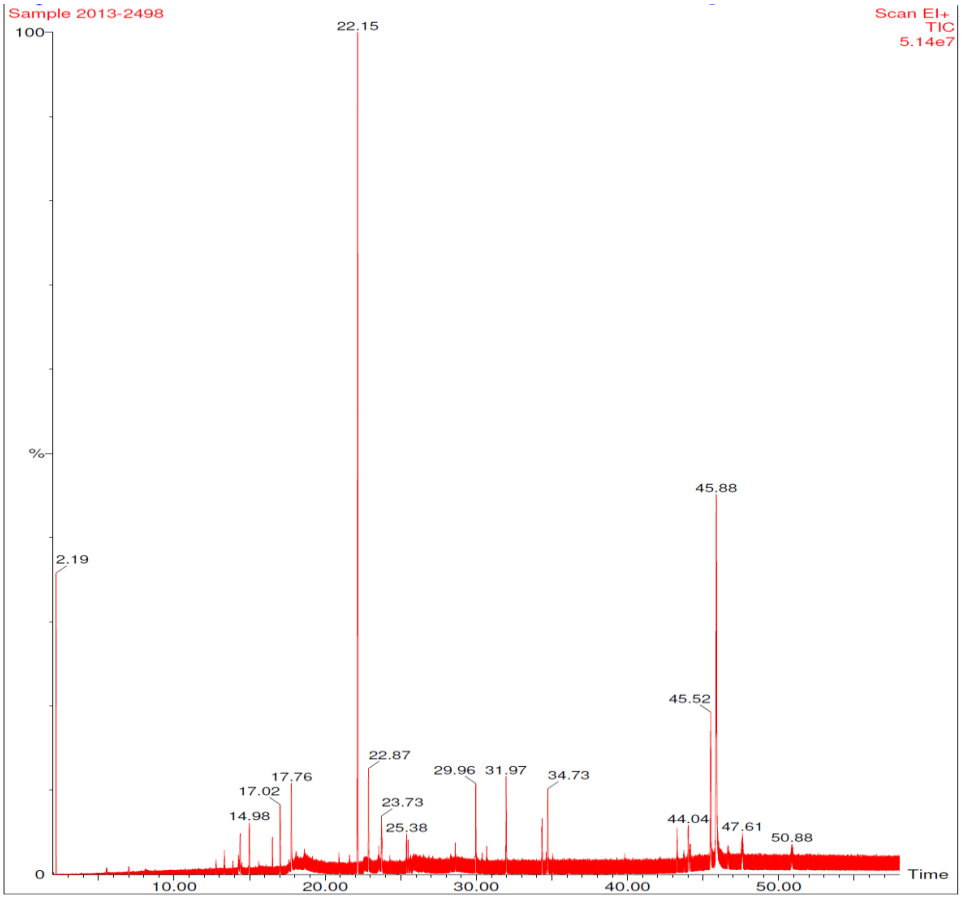

Fig. 1. GC- MS chromatogram of the methanolic extract of the leaves of Murraya koengii

3. Results and Discussion

GC-MS chromatogram of the methanolic extract of *Murraya koengii* (Figure-1) showed five peaks indicating the presence of five compounds. The chemical compounds identified in the methanolic extract of the leaves of *Murraya koengii* are presented in Table 1. GC-MS analysis revealed the presence of α.-Caryophyllene, 2-phenyl-4-quinolinecarboxamide, Phenanthrene, 10H-Phenoxaphosphine, 1,5-Diformyl-2,6-Dimethoxy-Anthracene. Keeping in view the tremendous pharmacological activities of its constituents, *M. koenigii* may be utilized to alleviate the symptoms of variety of diseases. Although the extracts of various parts of *M. koenigii* has numerous medical applications in different disorders, modern drugs can be developed based on its bioactivity, pharmaco-therapeutics, and mechanism of action, toxicity and after proper standardization. The wide spread of availability and extensive literature of M. koenigii in India thus makes it an attractive target for further pre-clinical and clinical research.

Table 1. Chemical constituents of the methanolic extract of the *Murraya koengii* leaves.

Sl. No	Sample	Retention time of major peaks	Fragments profile	Compounds matched
1	PE3, Curry leaves	22.15	93 & 161	ALPHA.-CARYOPHYLLENE
		45.88	248, 249	BENZENE, 1-DIMETHYLAMINO-4-(2-CYANO-2-PHENYLETHENYL, 2-PHENYL-4-QUINOLINECARBOXAMIDE
		45.52	294	PHENANTHRENE, 9,10-DIETHYL-3,6-DIMETHOXY
		45.52	279	10H-PHENOXAPHOSPHINE, 2-CHLORO-8-ETHYL-10-HYDROXY
		45.52	295	1,5-DIFORMYL-2,6-DIMETHOXY-ANTHRACENE

References

1. Satyavati, G.V, Gupta, A.K, Tendon, N. (1987). Medicinal Plants of India, Indian council of medical research, New Delhi India, 2, pp.289-299.
2. Nadkarni, K.M (1976). Indian Materia Medica, 3(1), Popular Prakashan, Mumbai, pp.196.
3. Kirtikar, K.R, Basu, B.D. (1981). *Indian Medicinal Plants*, 2(1), Oriental Enterprises, Uttarchal Pradesh, pp.473.
4. Shah, K.J, Juvekar, A.R. (2006). Positive inotropic effect of Murraya koenigii (Linn.) Spreng extract on an isolated perfused frog heart. *Indian Journal of Experimental Biology*, 44,pp. 481- 484.
5. Shrinivasan, K. (2005). Plant foods in the management of diabetes mellitus: spices as beneficial antidiabetic food adjuncts. *Int. J. Food Sci. Nutr*, 56(6), pp.399-414.

6. Manfred, F, John, M.P, Dajaja, D.S, Douglas, A.K. (1985). Koenoline, a further cytotoxic carbazole alkaloid from *Murraya koenigii. Phytochemistry,* 24, pp.3041-3043.
7. The Wealth of India, Council of Scientific and Industrial Research (2003), New Delhi, 317.
8. Ram, H.N.A, Hatapakki, B.C, Hukkeri, I.V, Aryavaidyan, J. (2002); 16(1), pp.40-44.
9. Kesari, A.N, Gupta, R.K, Watal, G. (2005). Hypoglycemic Effects of Murraya koenigii on Normal and Alloxan- Diabetic Rabbits. *Journal of Ethanopharmacolgy,* 97, pp.247-251.
10. Xie, J.T, Chang, W.T, Wang, C.Z, Mehendale, S.R, Li, J, Ambihaipahar, R, et.al. (2006).Murraya koenigii reduces blood cholesterol and glucose level in ob/ob mice. *American Journal of Chinese Medicine,* 34(22), pp279-284.
11. Rahman, M.M, Gray, A.I. (2005). A benzoisofuranone derivative and carbazole alkaloids from Murraya koenigii and their antimicrobial activity. *Phytochemistry,* 66, pp.1601-1606.