

Analysis of Volatile Oil in the Leaves of *Murraya koenigii*

P. A. Paranagama^{1*}, S. Wimalasena¹, G. S. Jayatilake², A. L. Jayawardena², U.M. Senanayake²
and A. M. Mubarak²

1. Department of Chemistry, University of Kelaniya, Kelaniya, Sri Lanka.

2. ITI, Colombo-07, Sri Lanka.

Abstract. The volatile oil in the leaves of *Murraya koenigii* Spreng grown in Sri Lanka was isolated by steam distillation. The oil was analyzed by Gas Chromatography and Gas Chromatography / Mass Spectrophotometer. Of the 53 compounds detected 36 amounting to 89.73% were identified. The major constituents were β -thujene (5.8%), β -phellandrene (18.9%), (E)- β -ocimene (12.7%), β -caryophyllene (23.3%), α -humulene (4.3%) and β -bisabolene (3.14%).

Keywords: *Murraya koenigii* Spreng., Rutaceae, essential oil composition, curry leaf, β -caryophellene

INTRODUCTION

Murraya koenigii, (English, "curry leaf"), is a member of the family Rutaceae (Jayaweera, 1980). In Sri Lanka its leaves are extensively used for culinary purposes. The juice of fresh leaf suppresses blood cholesterol level and is given as remedy for diarrhea and dysentery (MacLeod and Pieris, 1982). A number of studies concerning the composition and qualities of *Murraya koenigii* leaves have been reported (MacLeod and Pieris, 1982, Zhu, et al., 1988 and Wong and Tie, 1993). A study by MacLeod and Pieris (1982) on the *M. koenigii* leaves from Sri Lanka identified 32 compounds. The oil was found to contain 80% sesquiterpene hydrocarbons and 16% monoterpene hydrocarbons. The major compounds in the oil were β -caryophyllene (28.7%), β -gurjugene (21.4%), β -elemene (6.8%) and β -phyllandrene (6.1%) (MacLeod and Pieris, 1982). The analysis of curry leaves from China identified α -pinene (38.4%), β -pinene (6.3%), β -caryophyllene (12.9%) and γ -elemene (10.1%) as the main constituents (Zhu, et al., 1988). The essential oil obtained from Malaysian *M. Koenigii* was analyzed by Wong and Tie (1993) and they reported the presence of β -phyllandrene (24.4%), α -pinene (17.5%), β -caryophyllene (7.3%) and terpene-4-ol (6.1%) as the major compounds. This paper describes a detailed analysis by Gas Chromatography / Mass Spectroscopy of the essential oil of *M. koenigii* leaves grown in Sri Lanka. A comparison of the major volatile components of *M. koenigii* Spreng of Sri Lanka, Chinese and Malaysian plants was also made.

MATERIALS AND METHODS

Sample preparation: Leaves of *M. koenigii* were collected from Gampaha area in Sri Lanka. Leaves (100g) were chopped, mixed with water (500ml) and

extracted for 4 hours using a modified Likens and Nickerson (Paranagama, 1991) apparatus. Isopentane (20ml) was used to trap the volatiles. Cooling water in the condenser was maintained at 10°C using Fluka Term FT800 cooling water circulator. Additionally a dry ice / acetone condenser was also employed to prevent any loss of volatiles. The extract was concentrated to 2.0 ml and dried with anhydrous Na₂SO₄ and evaporated to dryness.

GC; Gas chromatographic analysis of the oil was conducted on two separate fused silica capillary columns (Supelcowax 10 and SPB-1; 30 m x 0.32 mm; 0.25 μ m film thickness) using a Shimadzu GC-9A instrument equipped with a flame ionization detector. The column was programmed from 50°C (2min), 50°C - 210°C at 2°C/min, 210°C (30min) with a Helium carrier gas. The injector and detector temperatures were kept at 250°C and 0.1 μ l of the oil was injected using a Grob sampler in splitless mode with a sampling time of 0.5 min. Area percentages for the components were obtained with a data processor.

GC/MS; GC conditions were as above with He as carrier gas; direct interface at 250°C; ionization voltage 70 eV, ion source temp. 250°C. Individual constituents were identified by comparison of their mass spectra and retention indices with literature data.

The experimental work was carried out in triplicates.

* Author for correspondence. Mailing address: P. A. Paranagama, Department of Chemistry, University of Kelaniya, Kelaniya, Sri Lanka. E mail: priyani@kln.ac.lk