

Essential oil composition of genetically diverse stocks of *Murraya koenigii* from India

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ABSTRACT: The essential oil composition of four genetically diverse stocks of *Murraya koenigii* leaves cultivated at the CIMAP Research Farm, Lucknow, were analysed by GC and GC–MS. The oil from the stock of the northern Indian plains, Lucknow, showed β -pinene (70.0%), β -caryophyllene (6.5%) and α -pinene (5.4%) as the major constituents, while the oil from the stock of the lower Himalayan range, Pant Nagar, showed α -pinene (65.7%), β -pinene (13.4%) and β -phellandrene (7.4%) as the major constituents. In contrast to the above, the oil from the stock of southern India, Kozhikode, showed β -caryophyllene (53.9%), aromadendrene (10.7%) and α -selinene (6.3%) as the major constituents. On the other hand, the oil from the stock of eastern India, Bhubaneswar, showed β -phellandrene (30.2%), β -caryophyllene (24.2%), α -pinene (15.0%), (*E*)- β -ocimene (5.0%) and aromadendrene (4.5%) as the major constituents. The GC–MS analysis of the stock oil samples from the northern Indian plains, lower Himalayan range, southern and eastern India resulted in the identification of 65, 56, 57 and 66, constituents, representing 99.2%, 98.8%, 87.4% and 98.2% of the oils, respectively. Copyright © 2002 John Wiley & Sons, Ltd.

KEY WORDS: *Murraya koenigii*; Rutaceae; essential oil composition; β -pinene; α -pinene; β -caryophyllene; β -phellandrene

Introduction

A member of the natural order of Rutaceae, *Murraya koenigii* (L.) Spreng., the ‘Indian curry tree’, is a pretty small shrub or tree up to 6 m in height and 15–40 cm in diameter. It occurs along the outer Himalayas, from Ravi eastwards, ascending to 1500–1655 m, in Assam, Chittagong, upper and lower Burma and the Andaman Islands. It is also found in Maharashtra and Tamil Nadu and abundantly in the high forests of the Western Ghats in Karnataka.^{1–4} Propagation is by seeds, which germinate freely under partial shade¹ in rich soil.² Plants of the genus *Murraya* have been reported⁵ to be widely used in traditional medicine in eastern Asia, Australia and South Africa, where they are used as tonics, stomachics, stimulants, carminative agents to treat influenza, fever, bronchial asthma, dysentery and the bites of poisonous animals and as a source for perfumery and flavour. The leaf oil of *M. koenigii* has been the subject of several studies.^{6–17} It has been observed that the chemical constituents of the essential oil from the leaves of *Murraya koenigii* vary with the locality. This prompted us to carry out the detailed analysis of leaf essential oils of four

genetically diverse stocks of *M. koenigii* cultivated at the CIMAP Research Farm, Lucknow.

Experimental

Material and Extraction of Volatiles

Forty-three genetically diverse stocks of *M. koenigii* assembled from the states of Uttar Pradesh, Orissa, Kerala, Tamil Nadu, Andhra Pradesh and Delhi were planted and maintained at the research farm of CIMAP, Lucknow, India, located at 26.5°N, 80.5°E and 120 m above main sea level, with an annual rainfall of 53.21 mm. The plants were planted during June 1997 in rows in an area of 1.75 × 1.75 m of 131.68 m² plot size. The plants received normal intercultural operation [weeding, hoeing and irrigation as per requirement and fertilizers 40 kg N (nitrogen), 40 kg P₂O₅ phosphorous, plus 10 trolleys of farmyard manure/ha in whole plots/pits 1 month before planting]. Leaves of *M. koenigii* were collected in February 2000 from the four different stocks maintained at the CIMAP Research Farm, Lucknow. The samples were taken from: the stock of the northern Indian plains, Lucknow, State of Uttar Pradesh; lower Himalayan range, Pant Nagar, State of Uttaranchal;

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