FLAVOUR AND FRAGRANCE JOURNAL
Flavour Fragr. J. 2002; **17**: 75–77
DOI: 10.1002/ffj.1047

Chemical composition of leaf and flower essential oil of *Lantana camara* from India

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Received 21 May 2001
Revised 17 July 2001
Accepted 23 July 2001

ABSTRACT: The chemical composition of leaves and flowers essential oils of *Lantana camara* from India were analysed by GC and GC–MS, which resulted in the identification of 71 and 64 constituents, representing 99.0% and 97.0% of the oils, respectively. The major constituents in the leaf oil were germacrene-D (20.5%), γ-elemene (10.3%), β-caryophyllene (9.4%), β-elemene (7.3%), α-copaene (5.0%) and α-cadinene (3.3%), while the major constituents in the flower oil were β-elemene (14.5%), germacrene-D (10.6%), α-copaene (10.7%), α-cadinene (7.2%), β-caryophyllene (7.0%) and γ-elemene (6.8%). A comparison with the chemical composition of *L. camara* oils of different origin showed that our oils were significantly different from others with respect to their major constituents. Copyright © 2001 John Wiley & Sons, Ltd.

KEY WORDS: *Lantana camara*; Verbenaceae; essential oils composition; germacrene-D; γ-elemene; β-elemene; α-copaene

Introduction

Lantana camara Linn is a prickly climbing aromatic shrub of the Family Verbenaceae. It is native to tropical America and was introduced in India as an ornamental and hedge plant. Now it has been completely naturalized throughout India. The flowers are small, usually yellow or orange changing to red or scarlet, in dense axillary heads.[1] It has been recorded that different parts of the plant are rich sources of various bioactive principles.[2–6] In Africa, infusion of the leaves are used against rheumatism, asthma, coughs and colds.[7,8] The whole plant and its infusions are considered to be antipyretic, diaphoretic and anti-malarial.[8,9]

The chemical composition of *L. camara* oils from different origins have been investigated previously[10–18] but no detailed analysis has been carried out on the essential oil composition of *L. camara* from India, except for a few short reports.[11,17] This prompted us to carry out detailed GC and GC–MS analysis of its leaf and flower essential oils.

Experimental

Plant Materials

The plant materials of *L. camara* were collected at flowering stage in the month of December 2000, from the Kukrail Reserved Forest, Lucknow. A voucher specimen has been deposited in the Herbarium Division of the Institute at Lucknow.

Isolation of Volatile Components

Fresh leaves and flowers were subjected to hydrodistillation in a conventional Clevenger-type apparatus for 7 h, as the yield of volatile oils was very poor—0.05% and 0.08% (v/w), respectively. The oils were dried over anhydrous sodium sulphate and stored at 4 °C until analysed.

Gas Chromatography (GC)

GC analysis of the oil was performed on a Perkin-Elmer 8500 gas chromatograph equipped with FID using BP-1 (methyl polysiloxane) (30 m × 0.32 mm i.d. film thickness 0.25 μm). Nitrogen was used as carrier gas at a flow rate of 10 ml/min and 10 psi inlet pressure; split, 1 : 80; temperature program, 60–220 °C at 5 °C/ min, then held isothermal at 220 °C for 5 min, then heated at 3 °C/ min to 245 °C and held isothermal at 245 °C for 5 min; injector temperature, 250 °C; detector temperature, 300 °C.

Gas Chromatography–Mass Spectrometry (GC–MS)

GC–MS data were obtained on a Shimadzu QP-2000 instrument at 70 eV and 250 °C. GC column: ULBON

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