

Chemical Composition of the Essential Oil of *Plectranthus tenuiflorus* from Saudi Arabia

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ABSTRACT: An oil of *Plectranthus tenuiflorus* produced from plants harvested in Saudi Arabia was analyzed by GC/MS. The principal component of the oil was found to be thymol (85.3%).

KEY WORD INDEX: *Plectranthus tenuiflorus*, Labiatae, essential oil composition, thymol.

INTRODUCTION: *Plectranthus tenuiflorus* is a small, downy, very leafy herb, with stems about 60 cm long and small lilac-blue flowers, found in the NW of Abha in Saudi Arabia (1). The plant is extremely aromatic but little previous work has been reported on this species, although oils from other *Plectranthus* species have been widely examined. They frequently contain aromatic odors including camphor and carvacrol from *P. amboinicus* (2), sabinyl acetate from *P. fruticosus* (3), and β -caryophyllene from *P. rugosus* leaf oil (4). A recent paper (5) has reported the composition of the essential oil of *P. tenuiflorus* (Vatke) Agnew from Kenya and found that it contained α -terpinene (10.2%), p-cymene (10.9%), and carvacrol (14.3%) as the major components, with significant proportions (>5%) of sabinene, β -cubenene and α -cubenene.

EXPERIMENTAL: Samples of *P. tenuiflorus* were collected in Taif, Saudi Arabia and cultivated before analysis in Jeddah. A specimen (No 1276) was deposited in the Herbarium, King Abdulaziz University, Jeddah. The leaves were collected and steam distilled. The distillate was examined using a Carlo Erba 800 gas chromatograph fitted with a Carlo Erba MD800 mass spectrometer. The peaks were identified by comparison with the NIST Mass Spectral library and by comparison with published retention indices (6). The peaks were separated using a J&W (Fulton CA) DB-5 MS column (15 m x 0.25 mm), 0.25 μ m film thickness using a temperature program of 50°C (5 min), 50°-250°C at 5°C/min and finally 250°C (15 min). The samples (1 μ L) were injected as solutions in dichloromethane using a split injector at 200°C.

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Table I. Principal components of *Plectranthus tenuiflorus* oil

Identification	Peak area percentage	Retention index (1)	Literature (1) (6)
1-hepten-3-ol	2.3		
p-cymene	3.3	1019	1026
γ -terpinene	1.8	1053	1062
terpinen-4-ol	1.9	1173	1177
thymol	85.2	1297	1290
β -caryophyllene	2.3	1406	1418

RESULTS AND DISCUSSION: The oil was found to contain one dominant constituent, which was identified as thymol by GC/MS and infrared spectroscopy of the oil and by comparison with an authentic sample. A number of minor components were also present and the more significant components could be identified by their mass spectra and retention indices (Table I), but a number of the smaller components could not be identified. The components differed markedly from those reported for the *P. tenuiflorus* sample from Kenya (5), in which the principal phenol was carvacrol (14.3%).

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REFERENCES

1. S. Collenette, *An Illustrated Guide to the Flowers of Saudi Arabia*. Scorpion Publ., London, p 278 (1985).
2. R. Vera, J. M. Mondon and J. C. Pieribattesti, *Chemical composition of the essential oil and aqueous extract of Plectranthus amboinicus*. *Planta Med.*, **59**, 182-183 (1993).
3. G. Fournier, M. Paris, S. M. Dumitresco, N. Pages and C. Boudene, *Contribution to the study of Plectranthus fruticosus leaf essential oil*. *Planta Med.*, **51**, 486-488 (1986).
4. P. Weyerstahl, V. K. Kaul, N. Meier, M. Weiruch and H. Marshall, *Volatile constituents of Plectranthus rugosus leaf oil*. *Planta Med.*, **49**, 99-102 (1983).
5. J. W. Mwangi, W. Lwande and A. Hassanali, *Composition of essential oil of Plectranthus tenuiflorus (Vatke)*. *Agron. Flavor Fragr. J.*, **8**, 51-52 (1993).
6. P. Adams, *Identification of Essential Oil Components by Gas Chromatography/Mass Spectrometry*. Allured Publishing, Carol Stream, IL (1995).