B059 Analysis of flavones in species of *Teucrium* from Macedonian flora

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Assay of flavones is performed in samples of *Teucrium chamaedrys* L., *T. montanum* L. and *T. polium* L., Lamiaceae, collected in several locations in Macedonia. Liquid-liquid extraction in 70 % ethanol during 24 hours with continuous stirring at room temperature was employed for extraction of flavonoid compounds from the plant material. The bulk extract was then concentrated under low pressure and fractionated by subsequent extractions with diethylether, ethylacetate and *n*-buthanol. Flavone aglycones were then analyzed in the diethylether extracts by reversed phase HPLC using C18 column (250x4.6 mm, 5 µm) and gradient elution with a mobile phase composed of water, acetonitrile and methanol. UV diode-array detector was used for identification of flavones based on comparison of retention times and UV-spectra to the ones obtained for authentic samples. For positive identification of the flavones, isolation and purification was performed using column chromatography on silica and TLC and then HPLC and UV-spectroscopic analysis (1). *T. polium* was found to be rich in luteolin, apigenin, cirsimaritine and a flavone (**F**) with the same UV-spectrum that cirsilineol, but with a significantly shorter retention time. Minor quantities of luteolin, diosmetin, cirsimaritine and **F**, and only traces of apigenin were identified in extracts of *T. montanum*. Significant quantities of the flavone **F**, lesser amounts of luteolin and cirsimaritine, and only traces of apigenin and diosmetin were found in *T. chamaedrys* extracts. A nonparameter approach for estimating the effect of -OH and -OCH_3 groups in various positions in the flavone ring on the retention time was employed for prediction of the most probable structure of the unknown flavone **F** (2, 3). This method implied that the flavone **F** is most probably cirsiliol, a 3'-OH derivative of cirsilineol. This is the reason for the identical UV-spectrum but shorter retention time of cirsiliol (**F**) compared to cirsilineol.

References: 1. Harborne, J.B. et al. (1986) Phytochemistry, 25: 2811-2816. **2.** Kaliszan, R. (1987) Quantitative Structure-Chromatographic Retention Relationships, John Wiley & Sons, New York. **3.** Chen, B. K. and Horvát, C. (1979) J. Chromatogr., 171: 15-28.

B060 Essential oil constituents from Iranian *Phlomis herba-venti* L. leaves

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Phlomis herba-venti L. (Labiatae) is a wild plant growing in Mazandaran province (1). Several *Phlomis* species are used in herbal medicine, e.g. for diseases of the respiratory tract or externally for treatment of wounds (2). The leaves of *Phlomis herba-venti* L. were collected in June 2001 from the suburb of Sari, Mazandaran province, north of Iran. A voucher specimen was deposited in the herbarium of the Department of Pharmacognosy, Mazandaran University of Medical Sciences. The leaves were subjected to hydrodistillation using a Clevenger-type apparatus for 5 h to yield 1.1% of yellowish oil. The oil after preparation was submitted to GC (Perkin-Elmer 8500 gas chromatograph with FID and a DB-5 capillary column 30 m × 0.25 mm; film thickness 0.25 µm) and GC/MS (Hewlett Packard 6890 series, with a similar DB-5 capillary column) analysis. The 23 components of the oil (about 97.2%) were identified by their retention time, retention indices relative to C_9-C_{28} n-alkanes, and by comparison of their mass spectra with those of authentic samples or with data already available in the literature. The relative percentage of compounds was calculated from the total chromatogram by the computer. Germacrene-D (33.9%), hexadecanoic acid (12.9%) and α-pinene (9.4%) were identified as major constituents.

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References: 1. Bucar F, et al. (1998) Phytochemistry 48: 573-575. **2.** Rechinger KH. (1982) Flora Iranica. Akademische Druck-U. Verlagsanstalt. Graz-Austria.