

PP23. Volatiles from *Smyrniium perfoliatum* (Apiaceae) grown in Austria

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Smyrniium perfoliatum L., perfoliate alexanders, is an umbelliferous biennial (Apiaceae) plant taxon native to the Mediterranean [1]. The rare occurrences of this species in Austria are possibly due to former uses as a cultural crop. For the present study, the plants were obtained from open areas of the Botanical Garden in Vienna and from a site near castle Liechtenstein, in the south of Vienna (Austria). *S. perfoliatum* is a plant low in essential oils. The oil contents decrease in the order: fruits, inflorescences, roots, stems, leaves. The essential oils were composed of sesquiterpenes, mainly germacrene D (6.5-32.7%) and germacrone (up to 28.6%) as well as of furanosesquiterpenes. Amongst these, 1 β -acetoxyfuranoeudesm-4(15)-ene and 1 β -acetoxyfuranoeudesm-3-ene were characteristic for the aerial plant parts. These compounds were also found in plants from Turkey [1] while the plants from the botanical garden Urbino (Italy) had aromadendrene and neryl isovalerate as the main oil compounds [2]. Plant roots from both Austrian sites contained curzerene = isofuranogermacrene and furanodienone as the main compounds in their volatile fractions. An SPME analysis of the headspace of fresh leaves and flowers revealed the presence of 80-84% of germacrene D and 2-4% of germacrone B while the furanosesquiterpenes were very low in relative amount.

In comparison, an inflorescence essential oil from *S. olusatrum*, alexanders, collected near Gubbio, Italy contained germacrone (23.4%), curzerene (18.4%) and myrcene (17.4%). A fruit oil from the same species originating from Lago Trasimeno, Italy, was composed of 1 β -acetoxyfuranoeudesm-4(15)-ene (25.5%), α -pinene (18.2%), curzerene (8.4%), alexandrofuran (5.7%) and germacrone (5.0%). However, the evaluation of the volatile fractions bears an uncertainty as germacrone and some furanosesquiterpenes are reported to undergo partial thermal decomposition under the conditions of gas chromatography [3].

References:

- [1] Mölleken, U. et al., 1998. *Phytochemistry* 47, 1079–1083.
- [2] Tirillini, B. et al., 1996. *J. Essent. Oil Res.* 8, 611–614.
- [3] Maggi, F. et al., 2012. *Food Chem.* 135, 2852–2862.

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