

OP4. Changes in the volatile compounds of two wormwood (*Artemisia absinthium* L.) accessions under controlled weather conditions

Huong Thi Nguyen^{1*}, Éva Zámboriné-Németh¹

Keywords: environment, *cis*-epoxyocimene, sabinene, essential oil, temperature

Two wormwood accessions (originating from Spain and Hungary) were grown in climatic chambers in order to determine the effect of temperature and light intensity on the composition of their volatile compounds. Young plants were grown in a controlled environment termed as “warm” (increasing temperature from 18 °C/10 °C to 27 °C/19 °C and 16 klx light intensity with a 14 h/10 h light-dark rhythm, respectively) and “cold” ones (increasing temperature from 13 °C/8 °C to 18 °C/ 10 °C and 8 klx light intensity with a 14 h/10 h light-dark rhythm, respectively) for 14 weeks.

The EO yield of the investigated accessions varied from 0.188 mL/100 g (“Hungarian” accession grown in the “warm” chamber) to 1.092 mL/100 g (“Spanish” accession grown in the “cold” chamber) and the installed weather programs had no effect on the EO yield of any of the accessions. Evaluating the components higher than 1% of all detected GC areas, 33 compounds were identified with the total identified percentage varying from 88.8% (“cold” treatment of the “Hungarian” accession) to 92.5% (“cold” treatment of the “Spanish” accession). The well-established chemical differences between the two investigated accessions of wormwood, determined in our former study [1], have been confirmed by the present data. The major components of the oils were sabinene (0-10.8%), β -myrcene (1.7-16.5%), *cis*-epoxyocimene (1.2-57.7%), *cis*-chrysanthenyl acetate (0-13.8%), and (Z)-nuciferyl isobutyrate (1.7-10%). The “Spanish” accession represents a “*cis*-epoxyocimene” chemotype while the “Hungarian” accession exhibits a much more variable profile with sabinene and β -myrcene as the most characteristic components. The results showed that the accumulation of volatile compounds was not influenced by the weather under the investigated parameters. However, the different weather conditions induced quantitative changes in the EO profile of both chemotypes. The relative amount of *cis*-chrysanthenyl acetate increased from 8.0 (“cold” chamber) to 13.8% (“warm” chamber) in the oil of the “Spanish” plants while sabinene increased from 2.3 to 10.8% and β -myrcene rose from 8.0 to 16.5% in the “cold” and “warm” chambers, respectively, for the “Hungarian” oil samples.

References:

[1] Nguyen, H.T. et al. 2017. J. Appl. Bot. Food Qual. 90, 238–245.

Acknowledgments: The work was supported by the Stipendium Hungaricum Scholarship.

¹Department of Medicinal and Aromatic Plants, Faculty of Horticultural Science, Szent István University, Hungary.

*Corresponding author: nguyenhuongnimm@gmail.com, Nguyen.Thi.Huong@phd.uni-szie.hu