

PP93. Probing the existence of chemotypes of *Helleborus odorus* Waldst. & Kit. ex Willd. by essential oil analysis: a multivariate approach

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Helleborus species (family Ranunculaceae) are evergreen, rhizomatous plants with scientifically demonstrated biological/pharmacological activities [1]. Nonetheless, the essential oils of the genus are general poorly phytochemically and pharmacologically investigated. *Helleborus odorus* Waldst. & Kit. ex Willd. ('fragrant hellebore' or 'kukurek' in Serbian) is a highly toxic plant species growing on hillsides and in forests of the submediterranean region. Up to now, steroid-related compounds (saponins, ecdysteroids, bufadienolides), fatty acids and other lipids, and sugars of *H. odorus* were investigated. However, to the best of our knowledge, there are no previous studies of the essential oil of this species.

Analyses by GC and GC/MS of four essential-oil samples obtained from dry aerial parts and roots of *H. odorus* allowed the identification of 229 components, comprising 88.8-92.2% of the total oil composition. The major identified volatile compounds were 1-pentacosene (0.0-52.8%), tricosane (0.0-15.1%), linoleic acid (0.0-11.8%), *trans*-phytol (0.0-12.4%), hexadecanoic acid (3.7-16.8%), (2*E*,4*E*)-decadienal (*tr*-13.8%), linalool (0.5-6.0%) and hexanal (0.0-7.4%). In general, there were qualitative and quantitative variations noted in the compositions between the *H. odorus* essential-oil samples from different locations. The most discernable differences included a change in the content of the major constituent (1-pentacosene). These differences motivated us to explore (by multivariate statistical analysis (MVA)) the possible existence of several chemotypes of this species using essential-oil compositional data. Agglomerative hierarchical clustering and principal component analysis of the chemical data on the volatiles of the herein studied and additional 37 oil samples of Ranunculaceae showed a close relationship of *Helleborus* with other Ranunculaceae genera and the existence of only one chemotype of this species in the Serbian flora.

References:

[1] Meng, Y. et al., 2001. *Phytochemistry* 57, 401–407.

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