



## Chemical composition of two samples of *Humulus lupulus* flowers (vernalized and wild hops)

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**Background and objectives:** *Humulus lupulus*, a plant belonging to the family Cannabaceae, is used as a medicinal plant with therapeutic applications in different nations. In this study, two samples of *H. lupulus* (vernalized and wild hops) were selected for further analysis about differences of their essential oils. **Methods:** The essential oils from the flowers of two *H. lupulus* (vernalized and wild hops) were achieved through hydrodistillation and analyzed via gas chromatography-mass spectrometry. Retention indices for all compounds were determined according to the Kovats retention indices using *n*-alkanes series as standards. The components of the essential oils were identified by comparison of the retention indices and mass spectral data with those for the standards. **Results:** Analysis of the vernalized hops essential oil resulted in the identification of 64 components, representing 87.04 % of the total essential oil that principally contained  $\beta$ -caryophyllene (25.3%),  $\beta$ -bisabolole (16.7%) and  $\beta$ -elemene (5.3%). In the case of wild hops, 49 components were identified, representing 80.9% of the essential oil, among them  $\beta$ -bisabolole (35.2%),  $\beta$ -myrcene (13.3%) and  $\beta$ -sesquiphellandrene (11.3%) were the main compounds. Overall, both vernalized and wild hops possessed sesquiterpene hydrocarbons in higher contents, followed by non-terpenoid compounds, oxygenated sesquiterpenes and finally monoterpenoids in less amounts. **Conclusion:** Concerning the results of this study we found some similarities and differences among vernalized and wild hops and also in comparison with other species of the genus *Humulus*. Generally, mentioned similarities and differences might be attributed to both intrinsic and extrinsic factors affecting both the quality and quantity of the obtained essential oils.

**Keywords:**  $\beta$ - bisabolole, cannabaceae,  $\beta$ -caryophyllene