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49th International Symposium on Essential Oils (ISEO2018)
Book of Abstracts



UNIVERSITY OF NIŠ

WELCOME

On behalf of the Organizing Committee, it is my great pleasure to welcome you to the 49th International Symposium on Essential Oils (ISEO2018).

Over the years, this prestigious annual symposium has developed into a unique meeting arena between leading experts, academic and industry scientists involved in the essential-oil research and representatives of the essential-oil industry from all around the world. The 49th ISEO will feature plenary lectures and presentations of cutting-edge science of essential oils from a diverse group of scientists in the fields of natural product isolation, organic synthesis, chemometrics, chemical biology, biosynthesis, pharmacology and analytical methodology development. Recent advances and future trends in the application of essential oils and their constituents in the fragrance industry, pharmacy, cosmetology, food production and agriculture will be highlighted, as well. The meeting will provide opportunities for in-depth scientific discussions and sharing unpublished results in both formal and informal settings.

Although ISEO symposia have a tradition of nearly half a century, it will take place in Serbia for the first time. Niš is the third largest city in Serbia, situated on the river of Nišava and represents a cultural, economic, administrative, business and university center of southeastern Serbia. For centuries, an important geographical and strategic position of the town has determined its destiny, so this region was inhabited by the Romans, Goths, Illyrians, Celts, Ottomans, Slavs, etc. Alongside rich cultural and historical heritage, southeastern Serbia has a unique natural beauty with two stunning gorges surrounded by picturesque Suva planina mountain characterized by exceptional biological diversity.

Many geographers, travelers, and historians considered the city of Niš as a gateway between the East and West, and we will set this as our main goal—to unify scientists from universities, research centers and industry from all over the world and to join different cultures and knowledge together.

ISEO2018 abstracts are published in the Special Issue of *Facta Universitatis: Series Physics, Chemistry and Technology*, a scientific journal published by the University of Niš since 1986. The outstanding contributions presented at the ISEO2018 Symposium (plenary lectures, oral and poster presentations) will enjoy the opportunity of having their full work published in the *Food & Chemical Toxicology* Special Issue dedicated solely to the “Toxicity of essential oils and their constituents”.

I wish all of the ISEO2018 participants a highly successful and enjoyable symposium and many unforgettable memories of your stay in Niš, Serbia. Thank you for joining us at this meeting!

Dr Niko Radulović

The President of the ISEO2018 Organizing Committee

ISEO2018 Organizing Committee**President**

Niko Radulović

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PP38. Comparison of hydrodistillation (HD), microwave-assisted hydrodistillation (MHD) and supercritical fluid extraction (SFE) for the isolation of volatiles from chamomile flower

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Keywords: *Matricariae flos*, essential oil, extract, bisabolol oxide, spiroether, azulene, sesquiterpene lactone

Chamomile flower (*Matricariae flos*) is a herbal drug used mainly because of antiphlogistic, spasmolytic and antimicrobial properties, which are related to the presence of volatile essential-oil constituents (α -bisabolol and its oxides, chamazulene, spiroethers) and non-volatile compounds, such as sesquiterpene lactones, flavonoids, and coumarins.

In the present work, we used hydrodistillation (HD; sample-to-solvent ratio 1:20, 2 h), microwave-assisted HD (MHD; sample-to-solvent ratio 1:20, 2 h, microwave power 180 W) and supercritical CO₂ extraction (SFE; 40 °C, 100 bar, 3 h) to obtain isolates, from a commercially available chamomile flower tea. The composition of the isolates was analyzed using GC-MS. The obtained results of the relative content of the selected pharmacologically relevant constituents were as follows.

HD and MHD yielded 0.2% and 0.3% of isolates, respectively. A much higher yield was obtained in the case of SFE (3%). In HD and MHD isolates, which were qualitatively and quantitatively similar, oxygenated sesquiterpenes dominated (64.4-67.4%), with bisabolol oxides comprising 54.2-54.4% of the isolates. Among non-terpene constituents (17.0-19.9%), spiroethers were present with 10.0% and 11.7% of HD and MHD isolates, respectively. Chamazulene (4.8-4.9%) was the most abundant among sesquiterpene hydrocarbons (8.8-9.7%). On the other hand, non-terpene compounds (57.4%) were the most abundant class of constituents in SFE extract, and among them hydrocarbons comprised 45.0% of the extract, followed by 10.2% of spiroethers. Among the oxygenated sesquiterpenes (32.2%), SFE extract contained 25.8% of bisabolol oxides. In contrast to HD and MHD, SFE resulted in a low amount of chamazulene, but the extract contained 3.2% of valuable sesquiterpene lactones.

Having in mind that HD and MHD resulted in similar yields and compositions of the isolates, and that SFE gave a higher amount of the isolate with a unique composition, the choice of traditional vs modern technique for the preparation of chamomile isolates should be strongly dependent on the specific use of the final product and in that sense carefully evaluated.

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