

3rd International Conference on

Agricultural Engineering and Food Security

November 12-13, 2018 | Berlin, Germany

Concept of utilization of sage herbal dust as raw material for recovery of polyphenols and terpenoids

Branimir Pavlič and Zoran Zeković
University of Novi Sad, Serbia

The main aim of this work was valorization of sage (*Salvia officinalis* L.) byproduct from filter-tea factory for recovery of high value extracts with desirable properties for application in food, cosmetics and pharmaceutical products. Conventional (maceration) and novel (ultrasound-assisted, microwave assisted and subcritical water extraction) extraction techniques were applied for polyphenols recovery. Ethanol concentration was optimized in maceration process, while experimental design and response surface methodology were applied for optimization of novel extraction techniques. Polyphenols yield and antioxidant activity responses were investigated. Influence of main process parameters was determined for each technique by ultrasound assisted extraction (temperature, extraction time and ultrasonic power), microwave assisted extraction (ethanol concentration, extraction time and sample-solvent ratio) and subcritical water extraction (temperature, extraction time and HCl concentration in solvent). Liquid extracts obtained by novel extraction technique exhibited higher antioxidant activity and also provided higher polyphenols yield comparing to extracts obtained by maceration. Soxhlet extraction, hydro distillation and supercritical fluid extraction (SFE) were applied for terpenoids recovery. SFE was optimized by response surface methodology and optimal conditions were pressure of 290 bars, temperature of 55°C and CO₂ flow rate of 0.4 kg/h. The most abundant compounds in lipid extracts and essential oil were oxygenated monoterpenes (α -thujone and camphor), oxygenated sesquiterpenes (viridiflorol) and diterpene polyphenols (epirosmanol). Sage liquid extracts obtained by conventional and novel extraction techniques were spray dried in order to obtain dry extract form. Physico-chemical properties (chemical profile, moisture content, hygroscopicity, rehydration time, WAI and WSI) and biological activity (antimicrobial and antioxidant activity) were determined in dry extracts and their potential application in food and pharmaceutical formulations was discussed.

Biography

Branimir Pavlič has completed his PhD from University of Novi Sad, Faculty of Technology, Serbia. His fields of research are utilization of crops, food industry byproducts and agricultural waste for recovery of bioactive compounds for application of food or pharmaceutical sector, research and development of novel extraction techniques and mathematical modeling of extraction process. He has published more than 35 papers in well-known journals in the field of chemical engineering, agriculture and food science. He is working as Assistant Professor at the Department of Biotechnology and Pharmaceutical Engineering at the same university.

bpavlic@uns.ac.rs