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Poster Session-PO-39:

Polyphenol extracts from berry press residues: characterization of chemical composition and biological activity

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Berries of Northern European bogs and forests (Vaccinium spp.) contain significant quantities of various phenolic compounds. Most of these compounds are recovered when berry juice is produced. However, a considerable part of polyphenols remains in berry press residues and are discarded as food industry waste. The aim of the study was to compare the methods of extraction of polyphenols from press residues of American cranberry and optimize the extraction conditions. The impact of main extraction parameters (e.g., extraction time, solid/solvent ratio, solvent type) on the yield of extracted polyphenols was examined. Ultrasound-assisted extraction showed the highest potential from all studied methods, given its fast, convenient use and low cost it was possible to recover up to 5 g of polyphenolics from 100g of berry press residues (bilberry). Response Surface Methodology (RSM) was used to identify the optimal solvent composition for extraction, which was found to be 70% ethanol in combination with 1% formic acid. Antimicrobial activity of extracts was evaluated by the Agar Diffusion Method, which showed a potential use of extracts to inhibit growth of human pathogens in concentrations <0.0125 mg/L. Proliferation of human dermal fibroblasts was inhibited, and cell cytometry showed high antiradical activity in vitro, which was 2 times higher than that of Vitamin-C. The purified polyphenol extracts contained up to 15 different anthocyanins and 150 other polyphenols (identified by Orbitrap-MS) of which 37 were quantified and used for chemotaxonomic analysis. Taken together, these results put the waste product- berry press residues- as a valuable source of compounds that can be used to develop new nutraceuticals and functional foods with various health benefits.

Poster Session-PO-40:

Detection of chemical profile in Ophiopogonis Radix under different drying methods by LC-MS

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Ophiopogonis Radix, the root of Ophiopogon japonicus, it was rich in steroidal saponins, flavonoids,

Session 1-2-SL-03:

Surface Waxes of Northern Berries: a comprehensive study of cuticular wax composition

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Investigation of plant surface waxes began nearly 100 years ago with the isolation of C31 (hentriacontane) alkane from spinach leaves. Number of publications on plant waxes have rapidly grown since the first studies, which is due to development of new analytical techniques and mainly as a result of advancement of gas chromatography (GC). In the present day, gas chromatography is coupled with a mass spectrometer (MS), which allows efficient identification of unknown substances in complex mixtures. Plant surface waxes have a crucial role in the interaction between biotic and abiotic factors- the outermost layer of plant surface protects the plant from dehydration, extreme temperatures and other varying environmental factors as well as insect attacks, fungi infestation and bacteria. The most recent studies on plant waxes are motivated by the interest to increase shelf life of produce and reduce the risks of microbial infections in fresh fruit and vegetables. The main compound classes in plant surfaces waxes are triterpenoids, which are derivatives of squalene- these compounds possess various biological and pharmaceutical activities. In this study, 16 different berries grown in Latvia (Europe) were investigated and the differences were compared. Berry surface wax extracts were analysed as TMS esters using GC/MS. In the highest concentrations various phytosterols, alkanes, alcohols (including secondary alcohols) and fatty acids were found. In total 80 different substances were found of which 42 were identified and quantified. It was found that the same species of berries, but different varieties have similar wax profiles, however, berries within the same genus (Vaccinium spp.) have significantly different surface wax composition. Further investigation of wild berry surface waxes can give an important insight into the possibilities to prolong shelf life and quality of fruits, which, in turn, reduces losses to suppliers due to spoilage of produce and pest attacks.

Session 1-2-SL-04:

Metabolite profiling based evaluation of natural products from Hypericum

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The genus Hypericum comprises more than 450 species widely occurring in temperate regions and tropical