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"Polysaccharides and polysaccharide-based advanced materials: from science to industry"

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In vitro evaluation of the immunomodulatory potential of polysaccharide-containing complex from *Bulgarian lavender* and its active constituents

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Abstract

A crude polysaccharide extract (PSE) was obtained with boiling water from the aerial part of lavender. It contained 54.0% total sugars with 37.0% AUAC. A mixture of at least two acidic heteropolysaccharide fractions with the following monosaccharides: Ara, Gal, Rha, Xyl, Man, Glc, Fuc, GalA and GlcA were found. PSE exhibited high anti-complementary activity through the alternative pathway 57.5% at 78 μg/ml. Its effect on murine intestinal Peyer's patch immunocompetent cells and ROS production from human whole blood neutrophils was evaluated. At 100 μg/ml, it showed over 40% inhibition of the growth of different human tumor cell lines. Antioxidant activity correlated with high polyphenol content.

PSE was subjected to a liquid-liquid extraction with petroleum ether and *n*-butanol for partly separation of lower molecular weight constituents (hydrocarbons, saturated fatty acids, polyphenols, triterpenoids, etc.), which were detected by GC-MS and HPLC-UV. The rest macromolecular complex was fractionated by SEC on Sephacryl S-200 into two polysaccharide (chPS-L1 and chPS-L2) and one polyphenol (chPP-L) fractions. The IR spectrum of chPS-L1 was interpreted as a typical for pectic polysaccharide. Organic extracts and chromatographic fractions were tested for their anti-complementary activity. chPP-L and chPS-L1 showed the most potent activity through the classical pathway 46.9% at 78 μg/ml and 50.2% at 39 μg/ml through the alternative pathway, respectively. Therefore, polysaccharides and phenolic compounds are valuable biomolecules, aside from the essential oil of the lavender plant.

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