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Enzymatic production of pectin-derived oligosaccharides from sugar beet pulp as a component of animal feed

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Statement of the Problem: Pectin-derived oligosaccharides (POS) are promising candidates for new-generation prebiotics. Sugar beet pulp (SBP) has a very high content of pectin, a complex polysaccharide mainly made up of three structural polymers: homogalacturonan (HG) and rhamnogalacturonans I and II. The combination of shorter HG chain length, high degree of acetylation and the large amount of side chains contributes to the poor gelling properties of sugar beet pectin. However, according to the SBP composition, this feedstock could be a suitable starting material for obtaining a variety of non-digestible oligosaccharides (NDO) with biological activity, such as oligogalacturonides (OGaU), arabino-oligosaccharides (AOS), and galacto-oligosaccharides (GaOS). The purpose of this study is to evaluate the potential of sugar beet pulp as a raw material for pectin-derived oligosaccharides production, potentially suitable as a prebiotic component of animal feed.

Methodology & Theoretical Orientation: The commercial enzymes applied included polygalacturonase, pectin lyase, pectinmethylesterase, arabanase and cellulase. Oligosaccharides with different degrees of polymerization (DP) were assessed using high performance anion exchange chromatography.

Findings: The pattern of obtained oligosaccharides was affected by the time of enzymatic hydrolysis – higher oligomers were hydrolysed to molecules of lower molecular weight. Enzymatic hydrolysis using arabanase yielded the highest concentration of oligosaccharides (DP 1-10) and was the most promising method for their production.

Conclusion & Significance: The application of sugar beet pulp for prebiotics production may be new and economically viable method of their utilization

Biography

Agnieszka Wilkowska is currently working as a Researcher in the Institute of Fermentation Technology and Microbiology, TUL. She has a strong background in enzymology as well as in biologically active compounds acquiring and preservation. Her expertise in probiotics and prebiotics resulted in several patents. Currently, her main field of interest is the production of pectin-derived prebiotics enriched in viable probiotic microbial biomass developed by simultaneous saccharification and fermentation (SSF) from a low-cost by-product

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