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Recovery of Soluble Sugars from Waste Medium for Enokitake (*Flammulina velutipes*) Mushroom Cultivation with Hydrothermal Reaction and Enzyme Digestion

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Recovery of soluble sugars from waste medium for Enokitake mushroom cultivation was investigated using a hydrothermal reaction and enzyme treatment. The most suitable conditions for solubilization of hemicellulose fraction in the waste medium were found in the treatment with compressed hot water at 190°C, 1.8 MPa for 10 min. Under these conditions, a series of xylooligosaccharides from xylose to oligosaccharides with DP over 20 were detected in the soluble fraction. However, the yield of xylooligosaccharides decreased with an increase of the treatment temperature to over 190°C. The hydrothermal reaction at 190°C enhanced enzymatic digestibility and half of the residue was solubilized by cellulases, which was about eight times greater than enzymatic digestibility of non-treated medium. The combination of hydrothermal reaction and enzyme treatment made it possible to solubilize about 80% of waste medium, and about 20% of original waste medium remained, which was less than the sum of lignin and ash content.

Key words: hydrothermal reaction, waste medium, cellulase, hemicellulose, lignin

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