PRODUCTION OF XYLITOL FROM BIOMASS USING AN INHIBITOR-TOLERANT FUNGAL STRAIN

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Inhibitory compounds arising from physical–chemical pretreatment of biomass feedstock can interfere with fermentation of biomass sugars to product. A fungus, *Coniochaeta ligniaria* NRRL30616 improves fermentability of biomass sugars by metabolizing a variety of microbial inhibitors including furan aldehydes and aromatic- and aliphatic acids and aldehydes. Wild-type *C. ligniaria* incorporates xylose as a source of carbon and energy. A mutant of *C. ligniaria*, unable to grow on xylose, had xylose reductase (XR) and xylitol dehydrogenase activities reduced by approximately 70% compared to wild-type activity. The mutant retained ability to metabolize inhibitors in biomass hydrolysates and produced up to 0.46 g xylitol/g xylose in corn stover dilute acid hydrolysate. Optimal temperature and pH for xylitol production by *C. ligniaria* are 32°C and pH 5-8. Productivity (0.08 g/L h) was lower than values reported for yeast. Addition of a heterologous XR gene restored XR activity to near-WT levels, and increased xylitol yield by 17% (0.55 g xylitol/g xylose) in rich medium. These results suggest use of an inhibitor-tolerant strain in a sequential process, in which xylitol could be obtained as a coproduct of a lignocellulosic ethanol process.