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On-site cellulase production with feeding spent sulfite liquor by *Penicellium oxalicum* for integrated biorefinery

For improving economic feasibility of cellulosic ethanol from agricultural residues, cellulase should be produced on-site to reduce the cost of cellulose saccharification. Shandong Tranlin Group has developed a set of technologies to produce pulp and paper from million tons of straws by ammonium sulfite process, and produce fulvic acid as fertilizer from the spent sulfite black liquor. A very large amount of waste straw (straw clippings or chaff, about one third of feedstock) was leaved there without valuable usage. A new process was proposed to produce ethanol from those waste straws. The waste straw and wheat bran was used as main component of medium for cellulase production on-site. Since the black liquor contains large amount of oligosaccharides and nitrogen, it was fed into bioreactors as inducer and nutrients for cellulase production by fed-batch process. The cellulase activities increased at very low cost. The xylose in the hydrolysate also was fermented to ethanol by an engineered yeast strain constructed in our laboratory to increase ethanol concentration and yield. A pilot plant with a capacity of 2,500 tons cellulosic ethanol per year was designed and is constructing now, with expectation to built commercial facilities with capacity of 100,000 tons ethanol per year accompany with paper and fertilizer products hereafter.

Biography

Yinbo Qu graduated from Shandong University in 1974, got his PhD there in 1986, became a Research Assistant in 1981, and became Full Professor in 1993 in Shandong University. He had been a visiting scholar in The University of Tokyo, Lund University and Kyoto University. His main research interest is biodegradation and bioconversion of lignocellulosics by microorganisms. With cooperation of his colleagues, more than 300 papers and 10 books were published in his research fields. He was elected as Vice President of Chinese Society for Microbiology in 2006 and Advisory Board Member of Asia Federation of Biotechnology in 2010.

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