Xylitol Production by Xylitol Dehydrogenase-disrupted *Candida tropicalis*

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Abstract

Xylitol dehydrogenase(XDH) catalyzes the dehydration of xylitol to D-xylulose, the second step of yeast D-xylose metabolism. In biological process of xylitol production, the yield of xylitol from xylose is limited at the level of 70~80% because cells use xylitol for growth and maintenance. XDH is the unique link between xylitol and pentose phosphate pathway. Therefore, disruption of XDH activity can stop the consumption of xylitol, and can increase the yield of xylitol from D-xylose to the theoretical yield of 100%. A noble *xyl2* gene encoding a 365-amino-acid protein which has a mass of 39.4 kDa was cloned from *Candida tropicalis* ATCC 20913. A *xyl2* knockout strain was constructed using double knockout method accompanied the reuse of *ura3* markers, and has no activity of XDH, and can not grow on minimal medium containing D-xylose as a sole carbon source. An ability for xylitol production of the new strain was evaluated. The new strain produced xylitol of 12.5 g/L from xylose of 12.5 g/L for 24 hours.