

Comparison of Mannitol and Glucose for Ethanol Production by *Enterobacter sp.* JMP3

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Biorefinery from seaweed has become one of the most popular research topics for the development of alternative energy. Among them, approaches to realize high yield ethanol production utilizing seaweed have also been interests of many researchers. As mannitol is a major component in *Laminaria japonica*, in this study, its potential for production of ethanol and organic acids has been evaluated. Using *Enterobacter sp.* JMP3 isolated from the gut of turban shell, *Batillus cornutus*, mannitol and glucose were compared as different carbon sources. The results suggest mannitol show better production of ethanol than glucose: 0.27 g EtOH was produced by 1 g of mannitol while 0.14 g by 1 g glucose under anaerobic condition. At the same time, coincident less production of acetate appeared. This difference in metabolic distribution could be explained by different oxidation states of carbon sources where more NADH is generated prior to conversion of mannitol into fructose-6-phosphate, an intermetabolite of glycolytic networks compared with glucose metabolism. While ethanol production consumes more NADH than acids production, the additional NADH leads to an increase in the ethanol to acetate ratio.