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Submission date: 22-May-2023 02:17PM (UTC+0700)
Submission ID: 2099023380
File name: 2._Bukti_Kinerja_Prosiding_Internasional_ber-ISBN.pdf (140.53K)
Word count: 294
Character count: 1757

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The microbiological production of 1, 3-propanediol (1, 3-PDO) has attracted much attention as an alternative way to produce important platform chemical from glycerol. Metabolic engineering has emerged as a powerful tool to enhance the production of 1, 3-PDO by multiple strategies. Knoking-out lactate dehydrogenase (encoded by *ldh* gene) and acetolactate synthase (encoded by *budB* gene) have been extensively studied as a competitor on 1, 3-PDO production. However, there is a lack of information which comparing the profiles between *ldh* and *budB* gene deficient mutants on glycerol metabolism. An inactivation of *ldh* and *budB* gene in *Klebsiella pneumoniae* TWO were successfully constructed by insertion of a spectinomycin-streptomycin resistance marker. All mutants were incubated in flask experiments with 20 g/l glycerol over 30 h. Compared with the wildtype and mutant strains, the highest productivity of 1, 3-PDO was produced by *budB* inactivation (8.71 g/l), whereas reduced ldh activity decreased 11% in the productivity of 1, 3-PDO (6.93 g/l) and led to the 29% increase of ethanol production (2.32 g/l). These result suggested that the activity of *budB* could be a key factor on the enhancement of 1, 3-PDO production between 2, 3-BDO and lactate production, as the competitor by-products.

Keywords: 2, 3-butanediol, ethanol, homologous recombination, lactate

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