D-Lactic acid production using Lactobacillus sp. by batch and fed batch culture

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Lactic acid (LA) has been widely used in food, pharmaceutical, leather and textile industries. Recently, LA is expected to become a raw material for biopolymer (PLA) replacing the current commodity polymer originated from petrochemical sources. In order to produce high quality PLA polymer, the demand for pure D-LA is increasing as well as L-LA. Although numerous papers on LA production has been published, the report focusing on pure D-LA production was not enough. In this study, we tried D-LA with 3 different types of Lactobacillus sp. such as L. coryniformis subsp. torquens KCTC 3535, L. delbrueckii subsp. bulgaricus KCTC 3635 and L. delbrueckii subsp. bulgaricus KCTC 13412. In batch cultures of varied glucose concentration in the range of 100-200 g/L, LA productions were compared in terms of productivity and titer of LA. The optical purity of produced LA was also determined. Finally, in order to increase the productivity, fed batch culture was applied. Optical purities of D-LA was more than 98% in both batch and fed-batch cultures.