

Glycerol assimilation and production of 1, 3-propanediol by *Citrobacter amalonaticus* Y19

Ainala Satish Kumar, 박성훈<sup>1,\*</sup>  
부산대학교; <sup>1</sup>부산대학교 응용화학공학부  
(parksh@pusan.ac.kr\*)

*Citrobacter amalonaticus* Y19 (Y19) has been isolated based on the catalytic capability of carbon monoxide-dependent hydrogen production (water-gas shift reaction). In this study, we report the assimilation of glycerol and the production of 1,3-propanediol (1,3-PDO) by Y19. According to genome sequencing, Y19 had genes for the utilization of glycerol, 1,2-propanediol (*pdu* operon) and anaerobic synthesis of coenzyme B<sub>12</sub> (*cob* operon). By coenzyme B<sub>12</sub>-dependent PduCDE, the strain was expected to assimilate glycerol and produce 1,3-PDO. In shake flask cultivation under aerobic or microaerobic conditions with glycerol as a sole carbon source, Y19 showed a good growth and the production of 1,3-PDO and 3-HP. The production of 1,3-PDO under aerobic condition was improved by the exogenous supply of vitamin B<sub>12</sub>. On the other hand, under anaerobic conditions, neither growth nor product formation from glycerol was observed. When nitrate or fumarate was added as exogenous electron acceptor under anaerobic conditions, limited cell growth along with marginal production of 1,3-PDO was noticed. This study provides important information on glycerol metabolism and product formation by *C. amalonaticus* Y19.