

The effect of medium composition and culture condition for the production of fumaric acid from glucose by *Rhizopus oryzae*

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Fumaric acid called (E)-2-butenedioic acid is often used in the food and pharmaceutical industry. Fumaric acid is manufactured by chemical conversion from maleic anhydride in petrochemical process. However, this process has disadvantages: emission of greenhouse gases and usage of expensive maleic anhydride. On the other hand, fermentation process involves carbon dioxide fixation and it can use biomass-based glucose as a starting material. Filamentous fungi are widely employed to produce organic acids, enzymes, antibiotics. Many studies have discussed the growth morphology of fungi in the production of various compounds and it was found that fungal growth in pellet form is suitable for the fungal fermentations. *Rhizopus oryzae* has the capability to afford lactic acid, malic acid, fumaric acid, amylogucosidase, and α -amylase. In this study, we tried to develop the fermentation process to produce fumaric acid from glucose using *Rhizopus oryzae* and the effects of cultivation medium composition and culture conditions including aeration rate, agitation speed were investigated in terms of fungal growth morphology.