Enhanced Bioavailability of Phenol Results in the Production of Amino Acids in Iron-Supplemented *Corynebacterium glutamicum*

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Corynebacterium glutamicum is able to utilize phenol as a sole carbon source. Phenol is representative compounds that are degraded through the catechol branch of the β-ketoadipate pathway and used as energy source in TCA-cycle. In this study, it found that the phenol degradation occurred at 24 h in growing under minimal medium containing 200 ppm phenol, but at higher concentrations declined growth was shown. In order to enhance bioavailability of phenol, we attempted to supplement 1 % yeast extract and regulate the concentration of iron in culture medium. The growth rate was not increased in the presence of the 10-fold concentration of iron higher than normal condition. However, it observed that the production of total amino acids was tended to increase by excess iron-supplemented C. glutamicum. Furthermore, it was shown remarkably that production of proline and serine were increased up to 10-fold higher than normal condition. This result indicates that the excess iron activates the genes related phenol degradation and result in acting on the amino acids biosynthesis pathway.