



Screening for the best β -glucosidase and carboxylesterase activities for biotransformation

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Abstract

Bacterial enzymes play important roles in biotransformation. Most of them can biodegrade complex compounds into simpler ones. Geniposide is extracted from gardenia fruit which is an oriental folk medicine. And the biodegraded genipin is very easily to become blue and red when reacts with amino acids. The blue and red pigments are used to being natural food colorants in Japan and Asia. Recently, the concept of food safety has been increased by days. The requirement of natural food colorants is getting more and more in industries. The natural food color gardenia red is manufactured through the hydrolysis of the methyl ester of iridoid glucoside. Gardenia blue is also made from iridoid glucoside. In order to produce natural food colorants - gardenia red, we need the strains which have good β -glucosidase and esterase activity. In this study, we screened 162 bacteria strains for the best β -glucosidase or esterase activities and then optimize them. *Paenibacillus* sp -3--67 isolate showed the best β -glucosidase activity and *Chryseobacterium oranimense* -3--5(Y) isolate showed the best esterase activity. The maximum enzyme activity was then adjusted by growth time and culture conditions. Brain-Heart Infusion (BHI) medium was the best one for strain 3--67 to grow, furthermore, Nutrient Broth (NB) medium were good for β -glucosidase activity. The most suitable temperature for strain 3--67 to grow is 25°C. BHI medium was used to amplify bacteria population for 14hr and the best enzyme activity was showed while the pH of medium was around 8 at 25°C. In addition, YPD medium was good for strain 3--5(Y) to grow, however, NB was good for esterase activity. The best enzyme activity was showed while the pH of medium was around 6 and the best amount of growth was around pH 8. The most suitable temperature for strain 3--5(Y) to grow was around 25-30 °C. YPD medium was used to amplify bacteria population for 12hr and was replaced by NB medium to maximize microbial esterase activity. The best enzyme activity was showed while the pH of medium was around 6 at 25-30°C. We will use strain-3--67 and 3--5(Y) to transform geniposide into genipin-amion acid complex for further biological assays.

Key words : β -glucosidase; esterase; genipin-amion acid complex