Fermentasi kultur campuran kapang aspergillus oryzae dan aspergillus tamarii untuk optimasi produksi asam kojat = Fermentation using mixed cultures of aspergillus oryzae and aspergillus tamarii for optimization of kojic acid production

Dyah Karina Puspita Sukarna, author

Abstrak

Asam kojat merupakan metabolit sekunder yang dihasilkan melalui fermentasi kapang genus Aspergillus dan Penicillium yang menggunakan karbohidrat sebagai substrat. Penelitian ini bertujuan untuk mendapatkan kondisi fermentasi yang optimal yang dapat menghasilkan asam kojat dengan nilai yield tertinggi dari kultur campuran Aspergillus oryzae dan Aspergillus tamarii. Optimasi sumber karbon dan nitrogen, nilai pH medium, rasio konsentrasi inokulum, dan kondisi aerasi dilakukan secara bertahap. Dari sembilan variasi medium fermentasi, diperoleh sumber karbon dan nitrogen yang optimal yaitu sukrosa dan yeast extract dengan jumlah asam kojat 2,6163 g/l.
Optimasi nilai pH medium yang terdiri dari tiga variasi menghasilkan asam kojat terbanyak pada pH 3,5 sebesar 2,6163 g/l. Optimasi rasio konsentrasi inokulum dilakukan dengan tiga variasi rasio dimana rasio 2 : 3 inokulum A. oryzae dan A. tamarii menghasilkan asam kojat terbanyak sebesar 2,8889 g/l. Optimasi kondisi aerasi dilakukan dengan dua variasi volume medium dimana medium dengan volume 100 ml menghasilkan asam kojat dengan jumlah tertinggi yaitu 6,5594 g/l. Efisiensi dari proses fermentasi ditentukan dengan menghitung nilai yield asam kojat dimana didapatkan yield tertinggi 0,1396 gg-1.
<hr>AbstractKojic acid is a secondary metabolite produced by fermentation of Aspergillus and Penicillium mold using carbohydrate as the substrate. This research aims to determine the optimal fermentation conditions with high yield value from a mixture of Aspergillus oryzae and Aspergillus tamarii cultures. Optimization of carbon and nitrogen sources, pH value of medium, inoculum concentration ratio, and aeration were done gradually. From nine fermentation medium, the most optimal carbon and nitrogen source was sucrose and yeast extract which obtained 2,6163 g l of kojic acid.
Optimization of pH value consisting three various pH obtained 2,6163 g l of kojic acid in medium with pH 3,5. Ratio of inoculum concentration were optimized with three different ratio which the 2 3 of Aspergillus oryzae and Aspergillus tamarii became the most optimal ratio with 2,8889 g l of kojic acid. Aeration optimization was done with two various medium volume which medium with 100 ml volume obtained 6,5594 g l as the highest amount of kojic acid. The efficiency of fermentation was determined by calculating the yield value which was 0,1396 gg 1.