

**FORMULASI SEDIAAN KRIM ANTIHIPERPIGMENTASI
BERBAHAN AKTIF ASAM KOJAT
DARI JAMUR *ASPERGILLUS ORYZAE*
DENGAN PENAMBAHAN SUMBER KARBON SUKROSA**

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ABSTRAK

Hiperpigmentasi merupakan masalah kulit yang umum terjadi akibat produksi melanin berlebihan. Asam kojat, yang diproduksi oleh jamur *Aspergillus oryzae*, diketahui efektif sebagai *inhibitor* enzim tirosinase untuk menghambat pembentukan melanin. Penelitian ini bertujuan untuk memformulasikan sediaan krim antihiperpigmentasi berbahan aktif asam kojat dari *Aspergillus oryzae* dengan penambahan sumber karbon sukrosa serta mengevaluasi sediaan dan efektivitasnya. Metode penelitian meliputi fermentasi jamur, ekstraksi asam kojat, formulasi krim, dan uji aktivitas penghambatan tirosinase. Hasil identifikasi menggunakan LC-MS menunjukkan bahwa hasil fermentasi *Aspergillus oryzae* dengan penambahan substrat sukrosa dapat menghasilkan asam kojat. Penambahan sukrosa mampu meningkatkan produksi ekstrak asam kojat, namun jumlah biomassa yang dihasilkan lebih rendah dibandingkan tanpa penambahan substrat. Formulasi krim dengan penambahan ekstrak asam kojat 1% (F1); 1,5% (F2); 2% (F3) menghasilkan krim yang memenuhi syarat evaluasi sediaan yang terdiri dari uji organoleptik, homogenitas, daya sebar, pH, dan viskositas. Seluruh formula juga aman digunakan dengan indeks iritasi 0,00. Uji aktivitas menunjukkan F3 memiliki nilai inhibisi tertinggi $3,91\times$ lipat dibandingkan kontrol positif (vitamin C) dalam menghambat tirosinase. Dengan demikian, krim asam kojat dari *Aspergillus oryzae* dengan sukrosa berpotensi sebagai sediaan antihiperpigmentasi yang efektif.

Kata kunci : Asam kojat, *Aspergillus oryzae*, hiperpigmentasi, krim, sukrosa, tirosinase

**FORMULATION OF ANTI-HYPERPIGMENTATION CREAM
CONTAINING KOJIC ACID FROM ASPERGILLUS ORYZAE
WITH SUCROSE AS CARBON SOURCE**

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ABSTRACT

Hyperpigmentation is a common skin problem caused by excessive melanin production. Kojic acid, produced by the fungus *Aspergillus oryzae*, is known to be effective as a tyrosinase enzyme inhibitor to inhibit melanin formation. This study aims to formulate an antihyperpigmentation cream preparation containing kojic acid as the active ingredient from *Aspergillus oryzae* with the addition of sucrose as a carbon source and to evaluate the preparation and its effectiveness. The research methods include fungal fermentation, kojic acid extraction, cream formulation, and tyrosinase inhibitory activity test. The results of identification using LC-MS showed that the fermentation of *Aspergillus oryzae* with the addition of sucrose substrate can produce kojic acid. The addition of sucrose can increase the production of kojic acid extract, but the amount of biomass produced is lower than without the addition of the substrate. Cream formulations with the addition of 1% kojic acid extract (F1); 1.5% (F2); 2% (F3) produced a cream that met the evaluation requirements for the preparation consisting of organoleptic tests, homogeneity, spreadability, pH, and viscosity. All formulas were also safe to use with an irritation index of 0.00. Activity tests showed that F3 had the highest inhibition value of 3.91 times compared to the positive control (vitamin C) in inhibiting tyrosinase. Therefore, kojic acid cream derived from *Aspergillus oryzae* with added sucrose shows potential as an effective anti-hyperpigmentation formulation.

Keywords : Kojic acid, *Aspergillus oryzae*, hyperpigmentation, cream, sucrose, tyrosinase.