

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

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ABSTRAK

Penelitian ini bertujuan untuk memformulasi sediaan krim antihiperpigmentasi berbahan aktif asam kojat yang diperoleh dari fermentasi jamur *Aspergillus oryzae* dengan penambahan sumber karbon berupa laktosa. Produksi asam kojat dilakukan melalui proses fermentasi selama enam hari menggunakan media Sabouraud Dextrose Broth yang ditambahkan laktosa 1%. Setelah itu dilakukan ekstraksi cair-cair dan identifikasi asam kojat menggunakan metode LC-MS. Asam kojat diformulasikan ke dalam empat variasi konsentrasi krim (0%, 1%, 1,5%, dan 2%). Evaluasi krim meliputi uji organoleptik, homogenitas, pH, viskositas, dan daya sebar. Aktivitas antihiperpigmentasi diuji dengan melihat persentase inhibisi enzim tirosinase menggunakan metode ELISA. Formula krim dengan konsentrasi 2% asam kojat menunjukkan nilai inhibisi tirosinase tertinggi yaitu 9,4X lebih besar dari kontrol positif. Berdasarkan hasil tersebut, krim asam kojat hasil fermentasi *A. oryzae* dengan penambahan laktosa terbukti memiliki aktivitas antihiperpigmentasi dan berpotensi dikembangkan sebagai produk kosmetik yang lebih aman dan ramah lingkungan.

Kata Kunci : *Aspergillus oryzae*, asam kojat, antihiperpigmentasi, tirosinase, laktosa, krim

**FORMULATION OF ANTI-HYPERPIGMENTATION CREAM
CONTAINING KOJIC ACID FROM *ASPERGILLUS ORYZAE* WITH THE
ADDITION OF LACTOSE AS A CARBON SOURCE**

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ABSTRACT

This study aimed to formulate an anti-hyperpigmentation cream using kojic acid derived from the fermentation of *Aspergillus oryzae* with the addition of lactose as a carbon source. Kojic acid production was carried out through a six-day fermentation using Sabouraud Dextrose Broth supplemented with 1% lactose. The kojic acid was extracted via liquid-liquid extraction and identified using LC-MS. It was then formulated into four cream concentrations (0%, 1%, 1.5%, and 2%). The cream was evaluated through organoleptic tests, homogeneity, pH, viscosity, and spreadability. Anti-hyperpigmentation activity was measured by assessing the tyrosinase enzyme inhibition percentage using the ELISA method. The 2% kojic acid cream formula exhibited the highest tyrosinase inhibition which is 9,4X greater than the positive control. These findings suggest that kojic acid cream derived from *A. oryzae* fermentation with lactose supplementation has anti-hyperpigmentation activity and potential as a safer and environmentally friendly cosmetic product.

Keywords: *Aspergillus oryzae*, kojic acid, anti-hyperpigmentation, tyrosinase, lactose, cream.