

## INTISARI

Penuaan dini pada kulit dapat disebabkan oleh paparan sinar UV B dalam jangka panjang karena sinar UV B merupakan radikal bebas yang dapat menyebabkan degradasi kolagen. Tetrahidropentagamavunon (THPGV-5) merupakan suatu senyawa sintesis dari golongan kurkumin yang mempunyai aktivitas antioksidan dengan metode penangkapan radikal DPPH yang lebih baik dari PGV-5 dan vitamin E. Tujuan dari penelitian ini adalah optimasi formula krim THPGV-5 supaya senyawa tersebut mampu memberikan efek *antiaging* dan tidak iritasi terhadap kulit yang telah terpapar oleh sinar UV .

Formula optimal didapatkan melalui optimasi dengan menggunakan *software Design Expert*<sup>®</sup> 7.1.5., berdasarkan respon viskositas, daya sebar, daya lekat dan pH. Metode *Simplex Laticce Design*, digunakan untuk menentukan daerah optimum dengan cara hasil uji dimasukkan dalam persamaan matematis sehingga diperoleh *counter plot*. Sifat fisik dan stabilitas krim diamati penyimpanan selama 1 bulan, stabilitas mekanik dengan sentrifugasi dan *thermal cycling test*. Penentuan skor iritasi berupa eritema dan edema menggunakan hewan kelinci albino dan histopatologi berupa ketebalan kolagen yang diambil dari histologi kulit punggung tikus putih jantan galur Wistar yang telah diberi paparan krim konsentrasi 0,01 %b/b dan paparan sinar UV B dengan dosis perhari 1,9 J/cm<sup>2</sup> selama 7 hari. Analisis optimasi formula menggunakan Anova dan ketebalan kolagen dianalisis secara statistik menggunakan SPSS 18 dengan taraf kepercayaan 95%.

Hasil penelitian ini menunjukkan bahwa krim THPGV-5 dengan konsentrasi 0,01 %b/b stabil dalam penyimpanan pada suhu ruang dan stabil secara *thermal cycling* dan mekanik. Jumlah senyawa THPGV-5 yang tertransport lewat membran *Shed snake skins* dihitung berdasarkan *flux* sebesar  $3,9 \times 10^{-5}$  µg/cm<sup>2</sup>/detik. Krim THPGV-5 0,01%b/b tidak memiliki respon iritasi dan mampu mencegah degradasi ketebalan kolagen.

**Kata Kunci : THPGV-5, optimasi, *antiaging*, kolagen**

## ABSTRACT

*Premature aging of the skin can be caused by exposure to UV B radiation in the long term due because UV B radiation are free radicals that can cause degradation of collagen. Tetrahidropentagamavunon (THPGV-5) is a compound from the class of synthetic curcumin analog has antioxidant activity with DPPH radical scavenging methods, the antioxidant of THPGV-5 is better than PGV-5 and vitamin E. The aim of study was the optimization of the THPGV-5 cream so that the compound was able to provide anti-aging effects on the skin exposed to UV B radiation.*

*The optimal formula obtained through the optimization using Design Expert® software 7.1.5., based on the response of viscosity, spreadability, adhesion and pH. Simplex Laticce Design method, was used to determine the optimum area by way of test results included in the mathematical equation in order to obtain a counter plot. The physical properties and storage stability of cream were observed, the mechanical stability by centrifugation and thermal cycling test. Determination score irritation erythema and edema using albino rabbit and histopathological form collagen thickness taken from the back skin histology of Wistar male rats that had been given exposure cream with a concentration of 0.010 %w/w and exposure to UV B radiation with a daily dose of 1.9 J / cm<sup>2</sup> for 7 days. Analysis of optimization formulas using Anova and collagen thickness were statistically analyzed using SPSS 18 with a level of 95%.*

*The results of this study showed that the THPGV-5 cream with a concentration of 0.01 % w/w was stable in storage at room temperature. Total of THPGV-5 compound were transported through the membrane Shed snake skins was calculated based on the flux of 3.9x 10<sup>-5</sup> mg/cm<sup>2</sup>/sec. THPGV-5 0.01 %w/w cream do not had an irritation response and capable of preventing the degradation of collagen. Based on this result, THPGV-5 cream had antiaging effects by prevent collagen degradation mechanism due to exposure to UV B.*

**Keywords :** *THPGV-5, optimization, antiaging, kolagen*