

INTISARI

Penelitian tentang optimasi proses pencampuran gel repelan *citronella oil* dengan *gelling agent* ; Carbopol 934[®] 3%b/v dan PEG 400 secara *factorial design* telah dilakukan. Penelitian ini bertujuan untuk mendapatkan proses pencampuran optimum gel repelan *citronella oil* yang memenuhi persyaratan mutu yaitu manjur dan dapat diterima oleh masyarakat.

Penelitian ini merupakan rancangan eksperimental murni dengan variabel eksperimental ganda (*factorial design*), bersifat eksploratif. Subyek uji dalam penelitian ini adalah formula optimum gel repelan *citronella oil* dengan *gelling agent* ; Carbopol 934[®] 3 %b/v dan PEG 400, dengan perbandingan sistem gel dan minyak 95 : 10. Proses pencampuran yang diteliti adalah lama dan kecepatan putar. Untuk optimasi lama dan kecepatan putar digunakan metode *factorial design* dua faktor dan dua level, 2^2 , dengan kombinasi formula (1), (a), (b), dan (ab). Optimasi tersebut dilakukan terhadap parameter sifat fisis gel yang meliputi daya sebar dan viskositas; parameter stabilitas fisis gel yaitu pergeseran viskositas dan modus nilai tengah interval ukuran partikel setelah penyimpanan satu bulan; serta efektivitas uji daya repelan terhadap jumlah nyamuk *Aedes albopictus* betina yang menempel pada kulit kelinci albino yang telah dioles formula selama 6 jam.

Hasil distribusi ukuran partikel menunjukkan kestabilan fisis gel yang berarti dan analisis data menunjukkan bahwa efek faktor kecepatan putar dominan meningkatkan respon daya sebar, efek faktor lama putar dominan meningkatkan viskositas. Efek interaksi lama dan kecepatan putar dominan menurunkan pergeseran viskositas, sedangkan efek faktor kecepatan putar dominan meningkatkan respon modus nilai tengah interval ukuran partikel yang ideal. Faktor kecepatan putar, lama putar dan interaksinya tidak berefek pada respon daya repelan. Selanjutnya, setiap hasil pengukuran tersebut dibuat *contour plot* dan dilakukan *super imposed*. Area optimum untuk daya sebar, viskositas, pergeseran viskositas dan daya repelan, gel pada level yang diteliti diperoleh dari area persekutuan setiap *contour plot* tersebut.

Kata kunci : *Citronella oil*, Carbopol 934[®] 3%b/v, PEG 400, Lama putar, Kecepatan putar, Gel, *Factorial Design*.

ABSTRACT

The research about optimization of mixing process of citronella oil repellent gell with gelling agent; Carbopol 934[®] 3%b/v and PEG 400 by factorial design was done. The objective of this research was getting optimum mixing process of citronella oil repellent gell which has good qualities (i.e effective and acceptable).

The research category was real experimental with double experimental variable (factorial design) and explorative. The subject research was optimum formula of citronella oil repellent gell with gelling agent; Carbopol 934[®] 3%b/v and PEG 400, with composition of system gell : oil was 95 : 10. The research studies were time and speed of revolution of mixer. That time and speed of revolution were optimization by factorial design application, two factor and two level, 2², with combination of (1), (a), (b), and (ab) formulas. Optimization process was done for; parameter of gell physic characteristic i.e the spreading capability and viscosity; parameter of gell physic stability i.e the displacement of viscosity and the center value modus of size particle interval after they had kept for 1 month; and repellency of gell form to protect skins of albino rabbit which had spread by formulas from *Aedes albopictus* female mosquitos for 6 hours.

The research of size particle distribution shew a good gel physic stability and the data analysis shew that the factor effect of speed of revolution was dominant to increase the spreading capability response, the factor effect of the time of revolution was dominant to increase viscosity. They also shew that the effect of time and speed of revolution interaction was dominant to decrease displacement of viscosity and the the factor effect of speed of revolution factor was dominant to increase response of the center value modus of size particle interval . The speed and time of revolution and their interaction did not effect repellency response. The each contour-plot was made by every parameter measurement results. Moreover, the contour-plots were used to make optimum area by super imposed. The optimum area was got, which shew optimum parameter of the spreading capability, viscosity, displacement of viscosity and repellency in this research level.

Key words: Citronella oil, Carbopol 934[®] 3%b/v, PEG 400, Time of revolution, Speed of revolution, Gell, Factorial Design.