

RINGKASAN

PENENTUAN TINGKAT HIDRASI LIPOSOM DENGAN BAHAN AKTIF EKSTRAK KERING *Aloe vera*

Lidah buaya atau *Aloe vera* sebagai salah satu sumber bahan kosmetika dikenal manfaatnya sebagai pelembab atau *hydrating agent*. Disamping itu dapat merangsang duplikasi dari sel fibroblast pada lapisan dermis kulit lebih cepat dan memproduksi sabut-sabut kolagen serta elastin lebih banyak. Pula dapat mempengaruhi proses pembentukan melanin dengan menghambat kinerja dari enzim tirosinase. Sehingga secara menyeluruh, dikatakan lidah buaya mempunyai efek peremajaan kulit.

Untuk dapat menghasilkan suatu kosmetika dengan efek peremajaan kulit, dibutuhkan suatu sistem penghantar topikal dermal yang dapat menembus barrier stratum korneum kulit dan memiliki daya absorpsi optimal. Salah satu bentuk penghantar dengan kemampuan tersebut adalah teknologi vesikel dalam bentuk liposom.

Tujuan dari penelitian ini adalah menentukan efektivitas liposom dengan bahan aktif ekstrak kering *Aloe vera* yang dipergunakan sebagai sediaan kosmetika anti penuaan dini dengan mengukur tingkat hidrasi kulit.

Untuk itu rancangan penelitian terbagi dalam beberapa tahap. Pertama, membuat suatu sediaan liposom dengan bahan aktif ekstrak kering *Aloe vera*. Teknik yang dipergunakan adalah *passive loading* liposom kosong dengan metoda sonikasi. Alat yang dipergunakan adalah sonikator dengan tip 1/8 inci yang memiliki output 60 W. Sonikasi dilakukan selama 30 detik pada suhu 8 °C. Dilanjutkan dengan proses pemisahan dengan tehnik sentrifugasi.

Untuk pembuatan diujicobakan beberapa formula. Stabilitas fisik dan kimia dari formula diuji selama 2 minggu. Stabilitas fisik diuji dengan menggunakan *scanning electron microscope* untuk mengevaluasi morfologi dan diameter vesikel. Optimasi formula perbandingan berat antara liposom kosong dengan ekstrak kering Aloe adalah 12:1 dan 12:2.

Tahap berikut adalah pembuatan sediaan gel carbomer dengan bahan aktif formula yang optimal tersebut. Disamping gel yang mengandung liposom dengan bahan aktif *Aloe* tadi, dibuat pula gel dengan bahan aktif ekstrak kering *Aloe* dan gel dengan bahan aktif liposom kosong. Kandungan bahan aktif dari sediaan gel adalah 0,5 %.

Selanjutnya dari keempat gel tersebut dilakukan uji tingkat hidrasinya dengan mengukur kadar TEWL dan kelembaban kulit. Uji ini dilakukan secara in vivo dengan melibatkan 60 responden wanita umur 30 – 40 tahun. Responden dibedakan berdasarkan jenis kulitnya, yaitu kulit berminyak, normal dan kering. Setiap responden dengan jenis kulit yang sama dibagi menjadi 4 kelompok. Masing-masing kelompok menggunakan jenis sediaan gel yang berbeda. Uji tingkat hidrasi ini dilakukan selama 4 minggu.

Pada uji efektivitas terdapat perbedaan efek hidrasi antara formula liposom ekstrak kering *Aloe vera*, liposom kosong, non liposom ekstrak kering *Aloe* yang tidak sama antar responden kulit berminyak, normal dan kering. Ini membuktikan bahwa ketebalan kulit dan kadar dari bahan aktif mempengaruhi efektivitas.

SUMMARY

Study in hydration level of liposomally *Aloe vera* as cosmetic products for early anti aging skin

Aloe vera, because of its widespread popularity has become an ingredient in wide variety of cosmetic products, including night creams, soaps, shampoos, suntan lotion and cleansers. This is not surprising that *Aloe vera* has also been added to many cosmetics product for its rejuvenation action.

It achieves this in several different ways. Firstly, the polysaccharides act as moisturizers, hydrating skin. Secondly, aloe is absorbed in skin and stimulates the fibroblasts to replicate themselves faster and it is these cells produce the collagen and elastin fibre, so skin becomes more elastic and less wrinkled. It is also possesses the ability to interfere with the enzyme that produces melanin deposits in the skin.

As topical application for aging skin, cosmetic products should have good ability in transdermal delivery. Transdermal delivery is greatly limited by fact that the stratum corneum is relatively impermeable for most compounds. Hence, this route of delivery is often insufficient for uses in clinical practice. One of methods to increase the transport rate of cosmetic products across the skin is incorporation of active products into vesicles.

Liposomes, one of vesicles, have been investigated as a topical drug delivery system for skin. Liposomes are spherical vesicles whose membranes consist of one (unilamellar) or more (multilamellar) bilayers of phosphatidylcholine, which has ability to fluidize the lipid the lipid bilayers of the horny layer. This phosphatidylcholine is also known as a penetration enhancer.

The objective of this study was to determinate of the effectivity of *Aloe vera* loaded liposomes as cosmetic products for early anti aging skin, by measuring the transepidermal water loss (TEWL) and moisture content as the parameters of skin hydration level.

Multilamellar liposomes of *Aloe vera* were prepared by sonicated methode. These technique used sonicator with 1/8 inch microtip at 60 w energy

output. For loading, the liposomes suspension were sonicated for 30 s at 8⁰ C. Various formulation (composition for blank liposomes suspension and dried powder of *Aloe vera gel*) were studied to obtain liposomes with optimal trapping efficiency. Physical and chemical stability of these liposomes were assessed for 2 weeks. Physical stability was assessed by using scanning electron microscope to evaluate the morphology and diameters of vesicles.

The optimized liposomal *Aloe vera* formulations were incorporated with carbomer gel. These formulations were evaluated for the skin hydration level, compared with that of blank liposomal carbomer gel and dried powder of *Aloe vera* incorporated. Each gel formulations consisted of 0,5 % active ingredient.

The optimized composition for blank liposomes suspension and dried powder of *Aloe vera* were found 12:1 and 12:2. The effectivity of four type gels were assessed for 4 weeks. The skin hydration effects were evaluated by measuring the TEWL and moisture content of 60 women, aged 30 – 40 years old, having character of aging skin. These respondents were divided into 3 groups according to their skin types, eg. oily, normal and dry skin. Then each group was divided again into 4 groups to be treated by different kind of gel.

The results of this study showed that *Aloe vera* loaded liposomal gel have better effectivity in hydrating early aging skin than two other different gels. Instead, there were different effectivity in each groups of skin type. It showed that the effectivity were related to concentration of active ingredient and depth of the skin.

ABSTRACT

Study in hydration level of liposomally *Aloe vera* as cosmetic products for early anti aging skin

Liposomes are most novel development in vesicular system design for dermal and transdermal delivery. In this study this interaction was proved by determinating the effectivity of *Aloe vera* loaded liposomes as cosmetic products for early anti aging skin. To reveal this objective, skin hydration level was detected by measuring the transepidermal water loss and moisture content.

First, multilamellar liposomal *Aloe vera* were prepared by passive loading technique, that was sonicated methode. Various formulation were studied, in order to make liposomes with optimal trapping efficiency. Sonicator with 1/8 in microtip with 60 W energy output was used for loading blank liposomes with solution of buffer and dried powder of *Aloe vera* gel. Physical stability was assessed by using scanning electron microscope to evaluate the morphology and diameters of vesicles for 2 weeks.

The optimized composition for blank liposomes suspension and dried powder of *Aloe vera* were found 12:1 and 12:2. These formulations were incorporated with carbomer gel. These formulations were evaluated for the skin hydration level, compared with that of blank liposomal carbomer gel and dried powder of *Aloe vera*. Each gel formulations consisted of 0,5 % active ingredient.

The effectivity of four type gels were assessed for 4 weeks. The skin hydration effects were evaluated by measuring the TEWL and moisture content of 60 women, aged 30 – 40 years old, having character of aging skin. These respondents were divided into 3 groups according to the skin types, eg. oily, normal and dry skin. Then each group was divided again into 4 groups to be treated by different kind of gel.

The conclusion of this study is that *Aloe vera* loaded liposomal gel have better effectivity in hydrating early aging skin than two other different gels. Instead, there were different effectivity in each groups of skin type.

Keywords: *Cosmetic products; Liposome; Aloe vera.*