

FORMULATION AND STABILITY TEST OF ANTIAGING CREAM CONTAINING METHANOL FRACTION OIL OF PANGIUM EDULE.REINW. AS A RADICAL SCAVENGER AGENT

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SUMMARY

Indonesia is a tropical country having a temperature range of 25-35°C which can affect the skin and causes damages like aging. This aging process is due, at least, to free radical reactions. For this reason, many attempts had been done to find out creams containing natural antioxidant compound which have a potential of free radical scavenger. Kluwek, a fermented form of foot ball fruit or picung (*Pangium edule.Reinw*), had been proved to contain antioxidant compound in its methanol fraction oil to which antiaging cream was formulated. Stability evaluation was conducted for cream with Kluwek oil compared to base cream, including organoleptic (colour and odour), pH, viscosity, particle size, centrifugation test and flow characteristics either in room temperature (27°C) or stress condition (4°C and 50°C) for 8 weeks continuously, and six times cycling test at 4°C and 50°C every 24 hours. The results showed that cream with Kluwek oil and base cream were stable at temperature 27 and 4°C, cycling test and centrifugation test, but not stable at 50°C. Free radical evaluation was done by Electron Spin Resonance and the result showed that cream with Kluwek oil had less free radicals compared to base cream.

INRODUCTION

Asian countries like Indonesia as well as Malaysia, Singapore, Brunei Darussalam have the same tropical climate as 25-35°C and relative humidity as 75-80% , and the sun shines for the whole year with only two kinds of season, dry season and wet season. Excessive exposure to sun and UV light during daily activity can cause skin damage such as sunburn, premature skin aging, allergies and possible skin cancer. Antiaging creams are therefore widely used for preventing premature aging process by inhibiting cell oxidation as an active compound. An antioxidant compound is frequently included into the cream to protect the oxidation of cream as well.

The natural material used in this study was *kluwek oil* derived from the seed of *picung* (*Pangium edule Reinw.*), a fermented herbs spicy. The seed of *picung*, whether it was fermented or not, was known to have a strong antioxidant activity, even stronger than Butyl Hydroxy Toluene (BHT).The seed of *picung* has a high lipid content, to which the *kluwek oil* was derived., extracted with methanol. This methanol fraction had been proved to have an antioxidant activity as well (1, 2).

An effort to get natural antioxidant cosmetics dosage form substituting the synthetic one, had been conducted by formulating the kluwek oil into cream dosage form and monitoring the physical stability of that cream. The parameters to measure the physical stability of the cream were colour, consistency, and stable odour since the beginning, during the shelf-life time until the last portion used by the user. Emulsion stability is very important since an emulsion is a system which is thermodynamically unstable and it need a long time to estimate the signs of instability. To shorten the time, an accelerated stability test was conducted by heating and centrifugation

THE OBJECTIVE OF THE STUDY

The study aim is to investigate the physical stability of creams containing kluwek oil derived from methanol fraction of *picung* and the radical scavenging activity as well.

MATERIAL AND METHOD

The material used were kluwek , methanol, aq.demineralisates, cetyl alcohol, stearic acid, glyceryl mono phoshate, vaseline, propylene glycol, triethanol amin, triethanol amin, nipagin, nipasol. The equipments were laboratory glass wares, analytical balance (Shimadzu), blender (National), vacuum rotary evaporator, water-bath, centrifugation (Kubota 1500), pH meter, Viscometer (Brookfield), electron microscopy, Electron Spin Resonance (ESR)

The methods are including the isolation of methanol fraction from *kluwek* oil, the identification of *kluwek oil*, the free radical test on *kluwek oil*, formulating the cream, investigation of the cream including pH, viscosity, particle diameter, centrifugation and Electron Spin Resonance Spectrometer for free radicals counting on cream blanc and cream with *kluwek oil* after keeping on 27 and 50° C for 0 week and 8 weeks.

The creams were kept on a plastic container at different condition for 8 weeks.long. The condition are : 4° C,

27° C

50° C

Cyclic temperature between 4° C and 50° C (for 6 cyclus with 24 hours each)

The investigation on pH was only done at room temperature every day, the viscosity and the organoleptic performance was done every week and the measurement of the particle diameter was only done on the 0 week and the 8th week.

RESULT

1. The initial investigation on Kluwek oil :
 - PH 7.03 netral
 - Specific odour and no specific feeling
 - Broken white colour and became yellowish after weeks
 - Has no free radicals
2. The initial investigation on :
 - Cream blanc (B) : white-bright colour, nice odour, no specific colour on microscopic investigation, globule diameter size 1.15 μm , pH 6, viscosity 20000 centipoise with thixotropic rheogram
 - Cream with Kluwek oil (K) : white to yellowish-bright colour, specific odour, no specific colour on microscopis investigation, globule diameter size 1.32 μm , pH 6.16, viscosity 12000 centipoise with rheopexy rheogram
3. Stability of Cream B and K :
 - pH : Both were stable up to 8 weeks
 - Organoleptic : At 4° C and 27° C both cream were stable but at 50° C both cream were breaking into two phases
 - Globule diameter : At 4° C cream B increased the size about 1.22 μm and cream K decreased 0.75 μm . At 27° C both were increasing about 1.27 μm for B and 1.53 μm for K. At 50° C both creams increased the highest level compared to other temperature incubation. B increased 1.86 μm while K increased 1.83 μm .
 - Viscosity : Cream B at room temperature had increased the viscocity while K was decreased. At 50° C both had decreased the viscosity while at 4° C cream B decreased and cream K increased
 - Cycling Test : Cream B and K were stable
 - Centrifugation Test : Cream B and K were stable at 3500 rpm and 1 hour centrifugation test
4. Free radical investigation :
 - In the beginning and at the end of the week 8, cream B and K kept at 27° C incubator had no free radicals. After 8 weeks incubation at 50° C Cream B and K both showed free radicals but cream K had less free radicals than cream B

CONCLUSION

1. Cream with or without *Kluwek oil* were stable at 40° C, 27° C and cycling test, but at 50° C both were no stable
2. On Electron Spin Resonance measurement it was shown that cream with *Kluwek oil* had less free radicals after 8 weeks incubating at 50° C compared to cream without *Kluwek oil*, indicating that *Kluwek oil* has a free radical scavenger activity.

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