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Formulation and Physical Evaluation of Peel-Off Gel Mask Preparation from Cucumber Extract (Cucumis Sativus L.)

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ABSTRAK

Mentimun (Cucumis Sativus L.) merupakan salah satu sayuran buah yang banyak dikonsumsi di Indonesia dalam bentuk segar dan mengandung cairan yang kaya akan vitamin serta mineral. Cairan mentimun bermanfaat untuk menyegarkan kulit dan melembabkan wajah, sehingga perlu dikembangkan dalam bentuk masker gel peel off. Penelitian ini bertujuan untuk mengetahui formulasi dan evaluasi sediaan masker gel peel off berbahan perasan mentimun. Penelitian dimulai dengan optimasi basis gel viscolam untuk mengetahui konsistensi basis gel menggunakan tiga variasi konsentrasi (5%, 10%, dan 15%). Dari ketiga konsentrasi tersebut, viscolam 5% menghasilkan kekentalan dan kejernihan yang baik. Selanjutnya, dilakukan formulasi sediaan masker gel peel off dengan konsentrasi zat aktif 2,5% dan viscolam 5%. Evaluasi sediaan masker meliputi uji viskositas, pH, organoleptis (warna, aroma, tekstur), homogenitas, daya sebar, daya lekat, waktu mengering, dan uji hedonik. Hasil penelitian menunjukkan bahwa formulasi sediaan masker gel peel off dari perasan mentimun memiliki sifat fisik yang baik dan memenuhi syarat untuk penggunaan pada kulit

Kata Kunci: Masker Gel Peel Off; Perasan Mentimun; Viscolam; Uji Viskositas; Evaluasi Sediaan

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ABSTRACT

Cucumber (Cucumis Sativus L.) is one of the fruit vegetables widely consumed in Indonesia in its fresh form and contains a liquid rich in vitamins and minerals. Cucumber liquid is beneficial for refreshing the skin and moisturizing the face, thus it needs to be developed into a peel-off gel mask. This study aims to determine the formulation and evaluation of a peel-off gel mask preparation using cucumber extract. The study began with the optimization of the viscolam gel base to assess its consistency using three different concentrations (5%, 10%, and 15%). Among these concentrations, 5% viscolam produced a gel with good consistency and clarity. Subsequently, a peel-off gel mask formulation was developed with an active ingredient concentration of 2.5% and 5% viscolam. The evaluation of the mask preparation included viscosity testing, pH testing, organoleptic testing (color, aroma, texture), homogeneity, spreadability, adhesion, drying time, and hedonic testing. The results of the study show that the formulation of the peel-off gel mask from cucumber extract has good physical properties and meets the requirements for use on the skin.

Keywords: *Peel-Off Gel Mask; Cucumber Extract; Viscolam; Viscosity Test; Preparation Evaluation*

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1. Introduction

Cucumber is one of the fruit vegetables widely consumed in Indonesia in its fresh form. Cucumber contains saponins, proteins, calcium, phosphorus, sulfur, and vitamins A, B, and C. The fruit also contains a liquid rich in nutrients such as vitamins and minerals. This liquid is very beneficial for refreshing the skin and moisturizing the face [1,2]. The development of various skin care products has also led to an increased demand for skin care. One way to care for the skin is by using a moisturizer. As the needs and preferences of society have become more diverse, moisturizer products are now highly varied. In addition to meeting the chemical standards of a good moisturizer based on the Indonesian National Standard (SNI), the acceptance of moisturizer products by the public is also crucial, including factors such as color, texture, and scent [3,4]

The use of cucumber as a moisturizer can be obtained from cucumber juice, which contains 95% water that helps to naturally hydrate the facial skin as an active raw material in cosmetic production. One type of cosmetic that is currently very popular is face masks [5,6]. In general, a face mask works deeply to remove dead skin cells. It is used after a facial massage by applying it to the entire face, except for the lips, eyes, and eyebrows. A mask is a cosmetic product used for skin care, one of which is the peel-off mask. The gel peel-off mask has advantages, including easy drying, forming a film layer that is easy to wash off, and providing a cooling sensation on the skin [7].

Based on the explanation above, this study is interested in conducting research on the formulation and evaluation of peel-off gel mask preparations from cucumber extract (Cucumis sativus L.).

2. Methods

This study is an experimental research on the preparation of a peel-off gel mask from cucumber extract (Cucumis sativus L.).

Material and tools

The tools used in this study include a beaker, measuring cylinder, test tubes, Erlenmeyer flask, stirring rod, analytical balance, spatula, plastic bottle, dropper pipette, watch glass, microscope slide, filter paper, funnel, blender, water bath, and Brookfield viscometer. The materials used in this study are aquadest, cucumber juice, viscolam, triethanolamine, glycerin, polyvinyl alcohol, dimethynol-dimethyl hydantoin, aluminum foil, and tissue.

Preparation of Cucumber Juice (Cucumis Sativus L.)

Prepare the tools and materials to be used in making cucumber juice. Take 1 kg of cucumber, peel the skin, and remove the seeds from the fruit. Then, wash the cucumber thoroughly using running water, drain it, and then make cucumber juice using flannel cloth. The peel-off gel mask is made in three formulas with different concentrations of viscolam, namely F1 with 5% viscolam, F2 with 10% viscolam, and F3 with 15% viscolam. The preparation of the peel-off gel mask starts with weighing each ingredient. Polyvinyl alcohol is dissolved in hot aquadest in a beaker glass and stirred until fully expanded. Viscolam is dissolved in hot aquadest in a mortar, then ground until homogeneous. Then, add polyvinyl alcohol to the developed viscolam and stir until homogeneous. Add glycerin and triethanolamine to the polyvinyl alcohol and viscolam mixture and stir until homogeneous. DMDM hydantoin is added gradually to

the mixture of polyvinyl alcohol, viscolam, glycerin, and triethanolamine with constant stirring until homogeneous. Then, add cucumber juice that has been dissolved with aquadest and stir until homogeneous. Finally, add fragrance as needed [8]

The evaluation of the cucumber peel-off gel mask preparation (Cucumis sativus L.)

1. Viscosity Test
Viscosity is measured using a Brookfield viscometer spindle no.4 at 20 rpm. The gel mask is placed in a container, and the spindle, which has been installed, is lowered until the spindle tip is immersed in the mask. The viscosity scale is then recorded [9–14].

2. pH Test
The pH is measured using a pH meter by weighing 5 grams of the gel sample, then dissolving it in 10 mL of distilled water, and measuring with a calibrated pH meter. The pH of the mask should fall within the range of 4.5 to 6.5, the pH of the skin [9–14].

3. Organoleptic Test
The peel-off gel mask preparation is weighed 2 g and then observed for changes in color, shape, and odor. Replication is done 3 times for each formula [9–14].

4. Homogeneity Test
The homogeneity test of the peel-off gel mask preparation is done to determine if the mask ingredients are well mixed. Homogeneity is observed by checking if there are any lumps or coarse particles. The homogeneity test is conducted by applying 0.1 g of the sample to a transparent glass. Check for parts that are not well-mixed [9–14].

5. Spreadability test
The spreadability test is done by placing 1 g of peel-off gel mask sample at the center between two glasses, where the top glass is given a weight of 150 g. The measurement is taken after 1 minute, until the gel's spread diameter becomes constant. The ideal spreadability is 5-7 cm [9–14]

6. Adhesion test
The peel-off gel mask preparation of 1 g is applied to a glass slide, covered with another glass slide, and given a weight of 250 g for 5 minutes. The glass slides are placed in a test apparatus, and the adhesion time is measured starting from the moment the weight is removed until the two glass slides separate. The gel mask should have an adhesion time of more than 4 seconds [9–14].

7. Drying Time Test
1 gram of peel-off gel mask is applied to the skin of the arm, 7 cm in length and 7 cm in width. Then, the drying time until the mask forms a film is measured using a stopwatch. The ideal drying time for the gel mask is between 15-30 minutes [9–14].

8. Hedonic test
The hedonic test is performed with 5 respondents by observing the color, odor, and texture of the preparation. From these observations, the most preferred formula is determined [9–14]

3. Results and discussion

Table 1. Formulation of Peel-Off Gel Mask from Cucumber Extract (Cucumis Sativus L.)

Ingredients	Concentration	Function
Cucumber Extract 2.5%	2,5%	Active Ingredient
Viscolam	5%	Gelling Agent
Trietanolamin	0,5%	Alkali Ageant
Polyvinyl Alkohol	8%	Filming Ageant
Vanilla	Qs	Fragrance
Green Color	Qs	Colorant
DMDM Hydantoin	0,6%	Preservative
Aquadest	Add 100 ml	Solvent

The table above shows the formulation of the peel-off gel mask from cucumber extract (Cucumis sativus L.) using a gel base concentration of 5% viscolam. After obtaining the formulation results for the peel-off gel mask with three different concentration variations, the next step is to perform evaluation tests on the preparation, which include viscosity test, pH test, organoleptic test, homogeneity test, spreadability test, adhesion test, drying time test, and hedonic test [7].

The viscosity test of the preparation is conducted using a Brookfield viscometer with spindle number 04 and a speed of 20 rpm. The purpose of the viscosity test is to determine the viscosity of the prepared formulation. The results of the viscosity test on the cucumber peel-off gel mask preparation (Cucumis sativus L.) with a gel base concentration of 5% viscolam showed a viscosity of 2090 cps [15].

The pH test on the peel-off gel mask preparation is conducted using litmus paper, where the litmus paper is dipped into the peel-off gel mask preparation, and the resulting color on the litmus paper is observed. The results of the pH test on the preparation indicate that the quality of the peel-off gel mask preparation must match the pH of the skin, which is in the range of 4.5-6.5. Based on the pH test results, the obtained formula showed a pH of 6. This indicates that the preparation meets the required pH for a good skin mask [16].

The organoleptic test conducted on the peel-off gel mask preparation was done by observing directly the color, shape, and odor of the preparation. The observation of the cucumber peel-off gel mask preparation (Cucumis sativus L.) resulted in a green color, a thick consistency, and a vanilla fragrance.

The Homogeneity Test is performed to determine whether the prepared formulation meets the quality standard for homogeneity. Based on the test results, the peel-off gel mask formulation from cucumber extract (Cucumis sativus L.) did not have coarse particles when applied. This indicates that the peel-off gel mask formulation meets the homogeneity requirement because it has a homogeneous structure with no coarse particles during the test. The Homogeneity Test is performed to determine whether the prepared formulation meets the quality standard for homogeneity. Based

on the test results, the peel-off gel mask formulation from cucumber extract (Cucumis sativus L.) did not have coarse particles when applied. This indicates that the peel-off gel mask formulation meets the homogeneity requirement because it has a homogeneous structure with no coarse particles during the test.

4. Conclusion

Based on the results of the tests on the cucumber peel-off gel mask (Cucumis sativus L.), including viscosity, pH measurement, organoleptic evaluation (color, aroma, texture), homogeneity, spreadability, adhesion, drying time, and hedonic test, it was concluded that the formulation of the cucumber peel-off gel mask possesses good physical properties. The mask showed appropriate consistency, a pH level suitable for skin, and favorable sensory characteristics. Additionally, the formulation met the criteria for homogeneity, spreadability, and adhesion, with drying time and overall acceptability being consistent with the required standards for skin applications

Reference:

[1] Mallick PK. Evaluating Potential Importance of Cucumber (Cucumis sativus L . - Cucurbitaceae): A Brief Review 2022;10:12–5. https://doi.org/10.3126/ijasbt.v10i1.44152.

[2] From C. Hepato Protective And Antiulcer Properties Of Isolated 2016;3:63–9.

[3] Iskandar B, Sidabutar SEB, Leny L. Formulasi dan Evaluasi Lotion Ekstrak Alpukat (Persea Americana) sebagai Pelembab Kulit. J Islam Pharm 2021;6:14–21. https://doi.org/10.18860/jip.v6i1.11822.

[4] Mawazi SM, Ann J, Othman N, Khan J, Alolayan SO, Al SS, et al. A Review of Moisturizers; History, Preparation, Characterization and Applications 2022:1–19.

[5] Akhtar N, Mehmood A, Khan BA, Mahmood T, Muhammad H. Exploring cucumber extract for skin rejuvenation 2011;10:1206–16. https://doi.org/10.5897/AJB10.1072.

[6] Chandra R, Alam A. Phytochemical Analysis Using X-ray Diffraction Spectroscopy (XRD) and GC-MS Analysis of Bioactive Compounds in Cucumis sativus L . (Angiosperms ; Cucurbitaceae) 2022;13:124–31.

[7] Samsul E, Sinala S. Formulasi Masker Gel Peel Off Ekstrak Kulit Buah Langsat (Lansium domesticum L) dengan Variasi PVA (Polivinil Alkohol) 2022;8.

[8] Kartikasari D, Anggraini R. Formulasi Masker Gel Peel Off Dari Ekstrak Etanol Umbi Bawang Dayak (Eleutherinebulbosa (Mill .) Urb . Eleutherine 2018;15:1–11.

[9] Mu A, Suryadi A, Paneo MA, Thomas N, Manno MR, Sabrina PF. Formulasi Dan Evaluasi Sedian Gel Sabun Cuci Tangan Ekstrak Jeruk Kalamansi (Citrus Microcarpa). J Farm Teknol Sediaan Dan Kosmet 2025;2:1–15.

[10] Tungadi R, Thomas NA, Paneo MA, Latif MS, Voenna CD. Formulasi Dan Evaluasi Sediaan Perona Pipi Dalam Bentuk Compact Powder Menggunakan Zar Pewarna Alami Ekstrak Kulit Buah Manggis (Garcinia Mangostana L .). Indones J Pharm Educ 2024;4:10–7. https://doi.org/10.37311/ijpe.v4i1.18039.

[11] Aprianto Paneo M, Sy Pakaya M, Ain Thomas N, Ratu Cindana Moo F, Efriani Puluhulawa L, Thamrin R, et al. Formulasi Ekstrak Kulit Jeruk Nipis (Citrus Aurantifolia) Dalam Masker Gel Peel-Off Anti Aging Dengan Metode DPPH (2,2-diphenyl-1-picrylhydrazyl). J Farm Teknol Sediaan Dan Kosmet 2024;1:11–20.

[12] Mu A, Suryadi A, Paneo MA, Djuwarno EN, Balikan VA. Formulasi Dan Evaluasi Sediaan Emulgel Sabun Cuci Tangan dari Ekstrak Tomat (Solanum Lycopersicum L .). J Farm Teknol Sediaan Dan Kosmet 2025;2:45–54.

[13] Thomas N, Paneo MA, Mo'o FRC, Puluhulawa LE, Latif MS. Formulation of natural hydrogel from bromelain enzym and alginate-chitosan and the effectiveness test by in vivo in healing burns. J Med Pharm Chem Res 2025;7:944–59. https://doi.org/10.48309/jmpcr.2025.472155.1374.

[14] Mustapa MA, Paneo MA, Puluhulawa LE, Latif MS, Nani I. Formulasi Dan Evaluasi Sediaan Exfoliating Gel Sari Buah Anggur (Vitis vinifera L .). J Farm Teknol Sediaan Dan Kosmet 2025;2:35–44.

[15] Baiva PP, Kovalenko SM, Baranova II, Kutsenko SA, Tereshchenko L V. Experimental Research for Gelator Selection in the Development of a Medicine for the Treatment of the Second Degree of Acne 2017;2017:9–11.

[16] Yusuf AL, Agustina S, Nugraha D. Formulation And Evaluation Of Peel-off Gel Mask Moringa Leaves Extract (Moringa oleifera Lam) n.d.;00:37–50.