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Formulation and Evaluation of Face Mask Gel Peel Off Combination of Avocado Leaf Extract (Perssea Americana Mill) and Jicama (Pachyrrhuzul Erosus L.)

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ARTICLEINFORE

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ABSTRACT

Avocado leaves and jicama contain antioxidants. Topical use of antioxidants can reduce UVA radiation which can cause skin darkening. Utilization of avocado leaves and jicama is done by making a peel-off gel facial mask. This research was conducted to formulate and determine the physical quality of a gel peel-off facial mask combination of avocado and jicama leaf extracts. The quantitative experimental method was used and four formulas for varying the concentration of the active substance were prepared, with a comparison of the total extracts used, avocado and jicama leaf extracts. The combination of avocado leaf extract and jicama can be formulated as a gel peel off facial mask, with the results of physical evaluation have met the requirements.

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INTRODUCTION

Facial skin care aims to improve the health of facial skin and beautify its outer appearance (N. R. Sari & Setyowati, 2014). Caring for facial skin can also prevent disturbances or problems on the face (Agustin et al., 2017). Facial skin care can be done in a modern or traditional way. Modern facial treatments are usually carried out using creams that contain high chemical substances, and results can be seen in a short time. Meanwhile, traditional facial treatments use natural ingredients, such as fruit and vegetable extracts which are rich in nutrients, to nourish facial skin (Forestryana et al., 2021). Traditional treatments are safer because the ingredients used are natural.

One type of facial treatment is a mask. Masks are cosmetic preparations that are useful for providing moisture, improving skin texture, rejuvenating the skin, tightening the skin, nourishing and softening and brightening the skin tone, cleansing the pores, relaxing the facial muscles, and healing acne and acne scars (Rohmalia & Aminda, 2021). There are many types of masks, one of which is a peel-off mask, which is in the form of a gel and dries up after being applied to the skin for a certain time. This preparation will form a transparent elastic film layer so that it can be peeled off (Wahyuni et al., 2022). Peel-off masks have many advantages over other types of masks, namely being able to relax, remove dead skin cells, and with regular use can reduce wrinkles, besides that the active substances contained in peel-off masks can also be in contact longer with facial skin (Farida, 2014).

Some herbs have a synergistic effect on other plants and have complementary effects on other plants (Wasito et al., 2011). The combination of avocado leaves and jicama has benefits as a basic ingredient for making facial masks. Avocado and Jicama leaves contain antioxidants. Antioxidants are used to prevent skin aging. Antioxidant intake is obtained orally or topically by rubbing it on the skin. Topical use of antioxidants can reduce UVA radiation which can cause skin darkening. Topical antioxidants are also used to prevent aging and UV radiation from causing skin damage, treatments to prevent skin wrinkling and erythema caused by inflammation as a barrier to protect the skin (Sari *et al*., 2016).

Based on this description, the researchers formulated a gel peel-off facial mask that combined avocado (*Perssea americana* Mill) and jicama (*Pachyrrhuzul erosus* L.) leaf extracts. To find out whether or not the peel-off gel face mask is feasible, an evaluation of the peel-off gel face mask combination of avocado leaves and jicama is carried out, which includes organoleptic tests, pH tests, homogeneity tests, drying time tests, spreadability tests, and adhesion tests.

THEORETICAL OVERVIEW

Avocado plant (*Persea americana* Mill.) is a medicinal plant that has the benefit of preventing premature aging due to the presence of antioxidants (Rauf et al., 2017). The main bioactive compounds that act as antioxidants are saponins, alkaloids, flavonoids, terpenoids, safroles, and tannins found in the leaves (Widarta & Arnata, 2017). Avocado leaves have antioxidant activity (Anggraeny, 2019). While jicama is a plant that contains vitamin C, flavonoids and saponins (Novitri & Afriadi, 2019). The phenolic substances in jicama are quite effective in

inhibiting the process of melanin formation, so that pigmentation due to hormones, sunlight and acne scars can be prevented and reduced (Kartikasari, 2015). Jicama has antioxidant activity (Siregar et al., 2019).

METHODOLOGY

This research was conducted with a quantitative experimental design. Tools used include analytical balance, oven, aluminum foil, rotary evaporator, blender, filter paper, erlenmeyer, stir bar, white cloth, measuring cup, spatula, pipette, cup, glass jar, funnel, baking sheet, sieve mesh 40, knife, test tube, beaker glass, micropipette, volumetric flask, mortar and stamper, universal pH and hotplate. The ingredients used include avocado leaves, jicama, 70% ethanol, polyvinyl alcohol, HPMC, glycerin, TEA, propyl paraben, methyl paraben, and distilled water. The research procedure included several stages, namely preparation of raw materials, preparation of avocado leaf extract, preparation of jicama starch, formulation and preparation, as well as evaluation of peel off gel facial masks.

Raw Material Preparation. The avocado leaves used were obtained from the District of Kemalang, Klaten, Central Java while the jicama used was obtained from the District of Ponorogo, East Java. Making Avocado Leaf Extract refers to research (Mailana et al., 2016). The extract was prepared by the maceration method. Avocado leaves are cleaned of adhering dirt, then washed with running water until clean and drained. Avocado leaves are oven dried at 60°C. The dried avocado leaves are mashed using a blender. Then weighed as much as 100 grams. Avocado leaves are soaked in a glass jar using 1000 ml of 70% ethanol. Then stirred and allowed to stand for 3 × 24 at room temperature. Then, after 3 × 24 hours the avocado leaf simplicia was filtered using a funnel and filter paper until the pulp separated. The results of maceration or macerate are put into a flask to be evaporated using a rotary evaporator at 50°C. Furthermore, it was concentrated over a water bath at 40-50°C until a thick extract was obtained. The manufacture of Jicama Starch refers to research (Hanan & Puji, 2018). Jicama prepared and peeled off the skin, washed thoroughly. Jicama cut with a thickness of 5 cm. Then the pieces of jicama are put into the blender. Jicama is filtered using a white cloth. Then leave it for 24 hours to produce a precipitate (starch). Then it is dried in an oven at 40-60˚C for 4-6 hours. Jicama is ground and pounded using a blender, then sifted until smooth so that jicama starch powder is formed.

Formulation and manufacture of gel peel off facial mask preparations according to the table, modification of the study (Legowo et al., 2017).

Table 1. Formulation of Gel Peel Off Face Masks Combination of Avocado (Perssea americana Mill) and Jicama (Pachyrrhuzul erosus L.) Leaf Extracts

Material	F1(g)	F2(g)	F3(g)	F4(g)
Avocado Leaf Extract	-	1,5	1	0,5
Jicama starch	-	0,5	1	1,5
Povinil Alkohol	10	10	10	10
HPMC	4	4	4	4
Gliserin	10	10	10	10
TEA	2	2	2	2

Material	F1(g)	F2(g)	F3(g)	F4(g)
Metil Paraben	0,5	0,5	0,5	0,5
Propil Paraben	0,5	0,5	0,5	0,5
Aquadest (ml)	Ad 100	Ad 100	Ad 100	Ad 100

Description: The total amount of avocado leaf extract and 2% jicama starch. F1 = Formula without added extract (0%:0%); F2 = Formula with the addition of avocado leaf extract and jicama starch with a ratio (75%:25%); F3 = Formula with the addition of avocado leaf extract and jicama starch with a ratio (50%:50%); F4 = Formula with the addition of avocado leaves and jicama starch in the ratio (25%:75%).

Evaluation of a gel peel-off face mask combination of avocado leaf extract (*Perssea americana* Mill) and jicama (*Pachyrrhuzul erosus* L.). a). Organoleptic test. Organoleptic testing was carried out by observing the color, smell, and texture of the peel off gel mask preparation. b). pH test. Determination of the pH of the preparation was carried out using a Universal pH stick dipped in a diluted gel sample. After being completely immersed, the Universal pH is seen for changes in color and matched with Universal pH standards. c). Homogeneity test. Homogeneity check is carried out by placing the preparation between two glass objects and observing whether or not there are coarse particles in the preparation. d). Drying time test of preparations. As much as 1 gram of peel off gel mask is applied to the skin of the arm with a length of 7 cm and a width of 7 cm. Then the gel drying speed was calculated to form a film layer from the peel off mask gel using a stopwatch. e). Spreadability test. You do this by weighing 0.5 g of gel, placing it on a 20x20 cm glass, then covering it with another glass of the same size, and placing a weight on it, then measuring the diameter after letting it stand for 1 minute. Good gel spreadability is 5-7 cm. f). Stickiness test. The adhesiveness test was carried out to determine the adhesiveness ability of the preparation. Put enough gel on a glass object, place another glass object on top of the gel, press it with a load of 1 kg, leave it for 5 minutes, then release the hanger and record the time until the two glass objects are released. This evaluation refers to research (Sopianti & Agustin, 2019), (Sumiyati & Ginting, 2019), (Andiva et al., 2023), (Jamilatun, Lukito, et al., 2023), (Jamilatun, Rahmadianty, et al., 2023), (Syam et al., 2021)

RESEARCH RESULTS

The results of avocado leaf extract were produced from the extraction process using the maceration method with 100 grams of Simplicia powder and macerated using 70% ethanol as much as 1000 ml. The result of the thick extract was 10.038 grams. Extract yield calculation results obtained 10.038%. The results of avocado leaf extract and jicama starch are formulated into a gel peel-off facial mask preparation with a predetermined concentration. Each formula has a total volume of 100 ml. The formulation of the peel-off gel facial mask preparation was then carried out by organoleptic tests, pH tests, homogeneity tests, drying time tests, spreadability tests, and adhesion tests, with the results shown in Table 2.

Tabel 2. Results of Formulation of Gel Peel Off Face Masks Combination of Avocado (Perssea americana Mill) and Jicama (Pachyrrhuzul erosus L.) Leaf Extracts

F	Organoleptic	pH	Homogeneity	Drying Time (minutes)	Spreadability (cm)	Stickiness (seconds)
F1	Yellowish white color, characteristic odor, gel texture	7,4	Homogeneous	16,6	5,7	4,7
F2	Dark brown color, distinctive smell of avocado leaf extract, gel texture	7	Homogeneous	21	5,7	5,7
F3	Brown color, distinctive smell of avocado leaf extract, gel texture	7	Homogeneous	20,7	6,1	4,1
F4	Light brown color, distinctive smell of avocado leaf extract, gel texture	7	Homogeneous	22,7	6,2	5,4

Description: F = Formula. F1 = Formula without the addition of extracts (0%:0%); F2= Formula with the addition of avocado leaf extract and jicama starch with a ratio (75%:25%); F3= Formula with the addition of avocado leaf extract and jicama starch in the ratio (50%:50%); F4 = Formula with the addition of avocado leaves and jicama starch with a ratio (25%:75%).

DISCUSSION

Organoleptic test of peel-off gel facial mask combination of avocado and jicama leaf extracts includes color, smell, and texture. Based on the organoleptic test results of the peel-off facial mask combination of avocado and jicama leaf extracts, at F0 the mask had a yellowish-white color, a characteristic odor, and a gel texture. The yellowish-white color at F0 is because there is no additional extract in the formulation. The colors of F1, F2, and F3 are dark brown, brown, and light brown respectively. Meanwhile, the smell and texture of F1, F2, and F3 had the characteristic smell of avocado leaf extract and had a gel texture. The color difference in each formula is due to the different concentration ratios of the ingredients added. These results indicate that the organoleptic of the preparation

depends on the color, odor, and shape according to the extract used. The greater the concentration of the extract used can produce differences in color and aroma (Ain Thomas et al., 2022).

The pH test results for the four formulas ranged from 7-7.4. The test results show that these four formulas are safe to use because they are following the pH range, namely 4,5-8 (Kartika et al., 2021). Topical preparations must meet these requirements because if the pH is too alkaline it will cause the skin to become scaly, conversely, if the skin pH is too acidic it can trigger skin irritation. (Hamka & Hardiyanty, 2021); (Andiva et al., 2023). A homogeneity test was carried out to find out whether the materials used were mixed evenly and did not contain solid particles. Based on the results of the homogeneity test of the four formulas, it was found that all formulas were homogeneous. These results indicate that all formulations have met the parameters used because a good preparation must be homogeneous and free of clumping particles (Pratasik et al., 2019). The drying time test aims to determine how long it takes for the peel-off gel mask to dry on the skin surface until the mask forms a film that can be peeled off. Based on the test results, the drying time of the four formulas ranged from 16.6 to 22.7 minutes. These results indicate that all formulations are still in the drying time range of 15-30 minutes (Tanjung & Rokaeti, 2020). The spreadability test aims to determine the ability of the gel to spread on the surface of the skin when applied. Based on the test results the spreadability of the four formulas ranged from 5.7 to 6.2 cm. Good gel spreadability is 5-7 cm (Sholikhah & Apriyanti, 2020). In this spread power range, the peel-off gel mask shows a consistency that is very comfortable to use. The adhesion test is one of the important parameters in the manufacture of topical preparations. The adhesion test was carried out to see the ability of the gel to stick to the skin. A good gel has high adhesion because it shows a stronger bond between the gel and the skin so the absorption of the preparation will be higher (Susianti et al., 2021). The results of the adhesion test in this study showed that the four formulas ranged from 4.2 to 5.7 seconds which met the requirements of the adhesion test, which was more than 1 second. (Syam et al., 2021).

CONCLUSIONS AND RECOMMENDATION

The combination of avocado leaf extract (*Perssea americana* Mill) and jicama (*Pachyrrhuzul erosus* L.) can be formulated as a gel peel off facial mask, with the results of physical evaluation both organoleptic, pH, homogeneity, drying time, dispersion and adhesion have met the requirements. The limitation of this research is that it is not yet known how long the mask will last, so it is recommended for further research to test the stability of the mask.

FURTHER STUDY

Given their own limited experience and competence, it is not surprising that the researcher discovered numerous linguistic, writing, and presenting style flaws when composing this essay. The researcher consequently anticipates shrewd criticism and recommendations from a range of sources to ensure the work is flawless.

REFERENCES

Agustin, E. W., Ihsani, ade novi nurul, & Astuti, W. P. (2017). Kesiapan Menjadi Beauty Operator Pratama. *Teknobuga*, *4*(1), 9–17.

Ain Thomas, N., Tungadi, R., & Manoppo, Y. S. (2022). Pengaruh Variasi Konsentrasi Ekstrak Buah Mahkota Dewa (Phaleria macrocarpa) Terhadap Stabilitas Fisik Sediaan Krim. *Indonesian Journal of Pharmaceutical Education*, *2*(2), 143–152. https://doi.org/10.37311/ijpe.v2i2.13532

Andiva, H. A., Jamilatun, M., & Lukito, P. I. (2023). Formulasi dan Evaluasi Sabun Cair Kombinasi Ekstrak Kulit Nanas Madu (Ananas comosus (L) Merr .) dan Gel Lidah Buaya (Aloe vera (L) Webb .). *Jurnal Jamu Kusuma*, *3*(1), 35–41. https://doi.org/10.37341/jurnaljamukusuma.v3i1.55

Anggraeny, I. (2019). Formulasi Sediaan Masker Gel Peel-off Ekstrak Etanol Daun Alpukat (Persea americana Mill). *Skripsi*.

Farida. (2014). Formulasi Masker Peel Off Ekstrak Rimpang Rumput Teki Sebagai Jerawat. *Prosiding Seminar Nasional Dan Workshop "Perkembangan Terkini Sains Farmasi Dan Klinik IV*, *3*(2).

Forestryana, D., Jamaludin, W. Bin, Restapaty, R., & Ramadhan, H. (2021). Pemanfaatan Bahan Alam sebagai Sumber Daya Kosmetik untuk Perawatan di Kelurahan Sungai Tiung Kecamatan Cempaka. *Jurnal Ilmiah Pengabdian Kepada Masyarakat*, *6*(5), 518–523.

Hamka, Z., & Hardiyanty, S. R. (2021). Formulasi Dan Uji Efektivitas Sediaan Krim Minyak Nilam (Pogestemon cablin, Benth) terhadap Propionibacterium acnes. *Journal.Yamasi.Ac.Id*, *5*(1), 112–124. http://

Hanan, D. M., & Puji, A. N. (2018). Formulasi Dan Evaluasi Sediaan Masker Gel Peel-Off Pati Bengkoang (Pachyrrhizul Erosus.L) Untuk Flek Hitam Bekas Jerawat. *Jurnal Farmasi Muhammadiyah Kuningan*, *3*(2).

Jamilatun, M., Lukito, P. I., & Saputri, M. A. (2023). *Physical Quality and Sun Protection Factor Value of The Sunscreen Lotion Extract of Carrot (Daucus carota L .)*. *2*(9), 4258–4262.

Jamilatun, M., Rahmadianty, H. A., & Lukito, P. I. (2023). *Quality Analysis of Cream Scrub Combination of Moringa (Moringa oleifera) Leaf Extract and White*

Glutinous Rice (Oryza sativa glutinosa) Starch. *1*(03), 302–311.

Kartika, S. D., Suci, P. R., Nur, C. I., Safitri, H., & Kumalasari, N. D. (2021). Formulasi Sediaan Masker Gel Peel Off Ekstrak Temu Putih (Curcuma zedoaria) sebagai Anti Jerawat. *Jurnal Sains Farmasi*, 351–358.

Kartikasari, N. P. C. (2015). Pengaruh Proporsi Pati Bengkuang dan Tepung Kentang Terhadap Hasil Jadi Masker untuk Perawatan Kulit Wajah Flek Hitam Bekas Jerawat. *E - Journal*, *4*(1), 221–220.

Legowo, D. B., Iswandi, S., Ikhda, C., & Hamidah, N. (2017). Formulasi Sediaan Gel Peel-Off Sebagai Masker Dari Ekstrak Daun Kelor *(Moringa oleifera Lam)* Kombinasi Madu *(Mel depuratum)*. *C*, 366–371.

Mailana, D., Nuryanti, & Harwoko. (2016). Formulasi Sediaan Krim Antioksidan Ekstrak Etanolik Daun Alpukat (Persea americana Mill.). *Acta Pharmaciae Indonesia*, *4*(2).

Novitri, G., & Afriadi, A. (2019). Formulasi Sediaan Bedak Kompak Pati Bengkoang (Pachyrizhus Erosus L) Sebagai Pencerah Kulit Wajah. *Jurnal Dunia Farmasi*, *1*(1). https://doi.org/10.33085/jdf.v1i1.4347

Pratasik, M. C. M., Yamlean, P. V. Y., & Wiyono, W. I. (2019). Formulasi dan Uji Stabilitas Fisik Sediaan Krim Ekstrak Etanol Daun Sesewanua (Clerodendron squamatum Vahl.). *Pharmacon*, *8*(2), 261. https://doi.org/10.35799/pha.8.2019.29289

Rauf, A., Pato, U., & Ayu, D. F. (2017).). Aktvitas Antioksidan Dan Penerimaan Panelis Teh Bubuk Daun Alpukat (Persea Americana Mill.) Berdasarkan Letak Daun Pada Ranting. *FAPERTA*, *5*(12 (152)).

Rohmalia, Y., & Aminda, R. S. (2021). Analisis Penggunaan Perawatan Kecantikan Masker Alami sebagai Perawatan Kulit Wajah pada Masa Pandemic Covid-19. *Diversity: Jurnal Ilmiah Pascasarjana*, *1*(2). https://doi.org/10.32832/djip-uika.v1i2.5032

Sari, D. N., Mita, N., & Rijai, L. (2016). Formulasi Masker Peel Off Antioksidan Berbahan Aktif Ekstrak Daun Sirsak (Annona muricata Linn.). *Prosiding Seminar Nasional Kefarmasian*. https://doi.org/10.25026/mpc.v4i1.159

Sari, N. R., & Setyowati, E. (2014). Pengaruh Masker Jagung dan Minyak Zaitun

Terhadap Perawatan Kulit Wajah. *Journal of Beauty and Beauty Health Education*, *3*(1), 1–7.

Sholikhah, M., & Apriyanti, R. (2020). Formulasi Dan Karakterisasi Fisik Masker Gel Peeloff Ekstrak Lengkuas (Alpinia galanga, (L.) Sw). *Jurnal Ilmu Farmasi Dan Farmasi Klinik*, *16*(02), 99. https://doi.org/10.31942/jiffk.v16i02.3233

Siregar, I. D., Kusuma, H. S. W., Widowati, W., Marpaung, H. H., Ferdinand, S., Fachrial, E., & Lister, I. N. E. (2019). Antioxidant and Antityrosinase Activities of Ethanolic Pachyrhizuserosus Peel and Tuber Extract. *Majalah Kedokteran Bandung*, *51*(2), 75–81. https://doi.org/10.15395/mkb.v51n2.1628

Sopianti, D. S., & Agustin, M. (2019). Masker Gel Peel Off Dari Ekstrak Wortel (Daucus carota L) Peel Off Mask From Carrot Ekstrak (Daucus carota L). *Borneo Journal of Phamascientech*, *03*(02).

Sumiyati, S., & Ginting, M. (2019). Formulasi Masker Gel Peel off dari Kulit Buah Pisang Kepok (Musa paradisiaca L.). *Jurnal Dunia Farmasi*, *1*(3). https://doi.org/10.33085/jdf.v1i3.4375

Susianti, N., Juliantoni, Y., & Hanifa, N. I. (2021). Optimasi Sediaan Gel Ekstrak Buah Belimbing Wuluh (Averrhoa bilimbi L.) dengan Variasi Basis Karbopol 940 dan CMC-Na. *Acta Pharmaciae Indonesia : Acta Pharm Indo*, *9*(1), 44. https://doi.org/10.20884/1.api.2021.9.1.3669

Syam, N. R., Lestari, U., & Muhaimin. (2021a). Formulasi Dan Uji Sifat Fisik Masker Gel Peel Off Dari Minyak Sawit Murni Dengan Basis Carbomer 940. *Indonesian Journal of Pharma Science*, *1*(1), 28–41.

Syam, N. R., Lestari, U., & Muhaimin. (2021b). Formulasi Dan Uji Sifat Fisik Masker Gel Peel Off Dari Minyak Sawit Murni Dengan Basis Carbomer 940 Minyak sawit murni mengandung beberapa komponen yang baik untuk kulit wajah seperti tokoferol dan tokotrienol yang bersifat sebagai antioksidan , minyak sa. *Indonesian Journal of Pharma Science*, *1*(1), 28–41.

Tanjung, Y. P., & Rokaeti, A. M. (2020). Formulasi dan Evaluasi Fisik Masker Wajah Gel Peel Off Ekstrak Kulit Buah Naga Merah (Hylocereus Polyrhizus). *Majalah Farmasetika.*, *4*(Suppl 1), 157–166.

https://doi.org/10.24198/mfarmasetika.v4i0.25875

Wahyuni, D. F., Mustary, M., Syafruddin, S., & Deviyanti, D. (2022). Formulasi Masker Gel Peel Off dari Kulit Pisang Ambon (Musa Paradisiaca Var). *Jurnal Sains Dan Kesehatan*, *4*(1), 48–55. https://doi.org/10.25026/jsk.v4i1.875

Wasito, H., Ekowati, H., & Hayati, F. F. (2011). In Vitro Antioxidant Activity of Zingiber officinale, Piper retrofractum, and Their Combinations. *Indonesian Journal of Cancer Chemoprevention*, *2*(3), 295. https://doi.org/10.14499/indonesianjcanchemoprev2iss3pp295-298

Widarta, I. W. R., & Arnata, I. W. (2017). Ekstraksi Komponen Bioaktif Daun Alpukat dengan Bantuan Ultrasonik pada Berbagai Jenis dan Konsentrasi Pelarut. *Agritech*, *37*(2), 148. https://doi.org/10.22146/agritech.10397