

Antioxidant peel off mask formulation of tamarind seeds ethanol extract

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Abstract—The human body does not have excess reserves of antioxidants, so if a lot of radicals are formed, the body needs exogenous antioxidants. In an effort to get healthy skin we also must not forget about antioxidants to protect our skin. The adequacy of antioxidants is a bulwark to prevent the harmful effects of free radicals that damage the skin. But there are concerns about the possible side effects that have not been known from synthetic antioxidants, causing natural antioxidants to become a much needed alternative, one of which comes from plants. One plant that has antioxidant properties is tamarind seeds. *Tamarindus indica* L seeds contain polyphenol compounds and high antioxidant potential. The methanol extract of tamarind seeds has a higher content of polyphenol compounds and antioxidant potential than the methanol extract of other parts of the *Tamarindus indica* plant. Based on antioxidant research, the ethanol extract of tamarind seeds has an IC₅₀ value of 40.21 ± 4.07262 . The purpose of this study was to formulate an antioxidant peel off mask from tamarind seed extract using ethanol solvent with the maceration method. Furthermore, the extract obtained was formulated into a peel off preparation using 3 formulas with 5%, 10%, and 15% concentrations, respectively. The preparation is then tested for the evaluation of organoleptic preparations, homogeneity, pH, viscosity and flow properties, dispersibility, drying time, stability test, and irritation test

Keywords—Antioxidants, Peel off mask, *Tamarindus indica* L

I. INTRODUCTION

Tamarind seeds with the Latin name *Tamarindus indica* are a natural ingredient that can be used as a source of antioxidants. Tamarind seeds contain higher polyphenol compounds than other seeds.² The methanol extract of tamarind seeds has a higher content of polyphenol compounds and antioxidant potential than the methanol extract of other parts of the *Tamarindus indica* plant.⁵ Facial cosmetics that are generally used are available in various dosage forms, one of which is in the form of a peel-off face mask. Peel-off masks are usually in the form of a gel or paste, which is applied to the facial skin. After the alcohol contained in the mask evaporates, a thin and transparent film is formed on the facial skin. After contacting for 15-30 minutes, the layer is removed from the skin surface by exfoliating.⁶ Peel-off masks have several benefits including being able to relax facial muscles, cleanse, refresh, moisturize,

and soften facial skin.⁹ Gel masks have several advantages including easy use, and are easy to rinse and clean. In addition, it can also be removed or released like an elastic membrane.⁴ This study aims to make an antioxidant formulation of tamarind seed peel-off mask with ethanol extract. *Tamarindus indica* seeds have a high antioxidant content so they are good when used on facial skin. The benefits of *tamarindus indica* seeds which are good for use on the skin are suitable for making peel-off masks.

II. RESEARCH METHODS

Materials. Tamarind seeds, 96% Ethanol, Polyvinyl alcohol, Propylenglycol, Disodium EDTA, Ethanol, Propyl paraben, Methyl paraben, Aquades. **Tools.** Laboratory glassware, Digital scale, Aluminum foil, Kubota 6500 Centrifuge, Water bath, Petri dishes, Clamp, Spatel, Homogenizer, pH meter, Scatterability tester (Teflon ring), Brookfield Viscometer RV type, measuring tensile strength of peel-layer off (Tensile Strength Tester), Vacuum oven, rotary evaporator.

Making the ethanol extract of tamarind seeds

Extract of tamarind seeds (*Tamarindus indica* L.) which has been cleaned, crushed into powder, then macerated with 96% ethanol solvent to cover the sample with three repetitions. The maserate obtained is concentrated with a rotary evaporator to obtain a thick extract.⁷

Preparation of Peel-Off Gel Mask for Tamarind Seed Extract Gel

Extract of tamarind seeds with various concentrations of 5%, 10% and 15% is made into peel-off gel masks using 15% polyvinyl alcohol (PVA) as an auxiliary gelling agent. The peel-off gel mask preparation was then evaluated by organoleptic test, homogeneity, viscosity and flow properties, pH test, drying rate, tensile strength examination, and stability test for 3 weeks.

Table 1. Peel off mask dosage formula.

Materials	amount (%)			
	Blanko	F1	F2	F3
Tamarind Seed extract	0	5	10	15
PVA	15	15	15	15
Propylenglycol	15	15	15	15
Sodium Metabisulfite	0,1	0,1	0,1	0,1
Disodium EDTA	0,1	0,1	0,1	0,1
Propyl Paraben	0,2	0,2	0,2	0,2
Methyl Paraben	0,2	0,2	0,2	0,2
Ethanol 96%	15	15	15	15
Aquades.	Ad 100	Ad 100	Ad 100	Ad 100

III. RESULTS AND DISCUSSION

Organoleptic test

The preparation is a semi-solid gel form with a white bone color with a different color gradient for each concentration and has a distinctive orange smell. The white color of the bones results from the color of the tamarind seed extract used. The citrus smell is produced from the additive, namely citrus oil

Homogeneity Examination. Based on the homogeneity examination showed that all preparations were homogeneous. Gel mask preparations are said to be homogeneous if the preparation is evenly distributed, the surface is smooth and there are no coarse particles or lumps that are observed by the eye. The method of making masks affects the level of homogeneity, including the optimization of the speed and time of stirring the preparation. Homogeneity in the preparation is necessary so that the active substance is evenly distributed so that the same dosage and efficacy are obtained for each use.

pH test

The pH measurement results of each preparation are in the range 5.11-5.39. Formula III has the highest pH value. Increasing the extract concentration has an effect on increasing the pH of the preparation. However, the pH of the preparation is still within the normal skin pH range, namely 4.5-6.5.

Drying Speed

The drying speed of each preparation shows a different time. Based on observations, the higher the extract concentration, the less time it takes for the preparation to dry.

Table 2. pH of the preparation at a certain temperature

Temperature (°C)	t (week)	pH of the preparation			
		Blank	I	II	III
Kamar (25-30)	1	5,19	5,21	5,28	5,39
	2	5,19	5,21	5,28	5,38
	3	5,18	5,20	5,27	5,37
60	1	5,16	5,19	5,27	5,38
	2	5,14	5,16	5,26	5,37
	3	5,11	5,13	5,25	5,35

Deployment Ability

The results of the evaluation of dispersibility showed a different value for each preparation. The ability to spread has decreased for each preparation, from blank to formula III. This is due to an increase in the concentration of tamarind seed extract. The greater the extract concentration, the viscosity will increase, so the greater the resistance of the preparation to spread, the lower the ability to spread.

Viscosity and Flow Properties

viscosity

The results of the viscosity test of the peel-off gel mask preparation with the Brookfield Viscometer RF type used a spindle 6. The viscosity of the dosage was between 8000-68000 cPs. The lowest viscosity is on the blank, because there is no addition of the extract. The highest viscosity is found in formula III with the highest extract concentration of 15%.

Flow Properties

Based on the observations of the peel-off mask emulgel rheogram, it shows that the blanks, formulas I, II, and III have pseudoplastic thixotropic flow properties.

Results of the Stability Test for Measurement of Extension and Tensile Strength of Preparations

The results of the stability test of the elongation and tensile strength of the gel mask at room temperature (25-30°C) and 60°C. The preparation experienced an increase in tensile strength and was different for each extract concentration. The higher the extract concentration, the higher the elongation test value and tensile strength.

IV. CONCLUSION

The ethanol extract of tamarind seeds can be formulated into a peel-off gel mask preparation. In this study, the peel-off gel mask of tamarind seed extract varied in concentration of 5%, 10% and 15% with 15% PVA. The resulting peel-off gel mask is bone white with a distinctive orange smell with the addition of orange oil. The mask preparation is homogeneous, has a pH of 5.18-5.39, the ability to spread 1697,366-2807,191 mm², the drying time is 12.75-15.50 minutes, the tensile strength is 153.84-203.71, the viscosity is 8000- 68000 cPs.

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