Effectiveness Of Cream Formulation Of Carrot Seed Oil As Anti-Aging

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Abstract.
Carrot (Daucus carota L.) is a vegetable plant that has many uses for public health services in the world. Fresh carrots contain water, protein, carbohydrates, fat, fiber, ash, anti-cancer nutrients, natural sugars (fructose, sucrose, dextrose, lactose, and maltose), pectin, glutathione, minerals (calcium, phosphorus, iron, potassium, sodium, magnesium, chromium), vitamins (beta carotene, B1, and C) and asparagine. The purpose of this study was to characterize simplicia and carrot seed oil extract, and to determine the antioxidant activity of carrot seed oil extract with formulations of concentrations of 3%, 6% and 9% seeds on the effectiveness of anti-aging Moisture, Evenness, Pore, Spot and Wrinkle. Carrot seed oil can be formulated in a homogeneous cream dosage form with an oil-in-water emulsion type, pH 6.7-7.7; does not cause skin irritation and is stable on storage for 90 days at room temperature. Carrot seed oil cream with a concentration of 9% showed the best anti-aging effectiveness by increasing water content, reducing skin hardness, shrinking pores, reducing blemishes and reducing wrinkles compared to other cream formulas.

Keywords: *Skin, Carrot Seed Oil and Anti-Aging.*

I. INTRODUCTION

Aging is a human change caused by age, psychological and social factors. In general, aging is defined as human physical changes [1]. The aging process is an inevitable physiological process that will be experienced by every human being. This process is irreversible which covers all organs of the body including the skin. Ironically, this aging process is seen as a scary thing by most people, even though this process will continue with age [2].Aging of the skin can occur through the process of extrinsic processes. Extrinsic aging process is an aging process that occurs due to factors from outside the body that can induce skin aging. Sunlight is the main extrinsic factor that can cause skin aging (photoaging), where excessive sun exposure can cause various damage to the skin, because the photobiological effects of UVA and UVB which cause free radicals will damage the skin structure and cause DNA damage and reduce the response. immune. Photoaging will usually appear on body parts that are exposed to direct sunlight such as the face, neck, chest or arms in the form of clinical abnormalities such as hyperpigmentation (blackish brown spots) or hypopigmentation (white patches). In addition, other external factors can increase free radicals such as x-rays, pollution, cigarettes, pesticides, alcoholic beverages, drugs and unbalanced nutrition and others [3]. In addition, skin aging is also stimulated by free radicals which are chemically reactive species with unpaired electrons in their outermost orbitals. Free radicals are responsible for cellular and tissue-level damage to cells contributing to cell aging and death. This can be prevented by the presence of antioxidants. Antioxidant molecules capable of stabilizing free radicals. Humans have a complex antioxidant system, working synergistically to protect cells and organ systems from free radical damage.

However, under certain conditions, endogenous antioxidants become insufficiency and require exogenous antioxidants to maintain optimal cellular function [4] (Zalukhu et al., 2016).Aging can be inhibited by one of them using anti-aging such as drugs or cosmetics [1]. Drugs or cosmetics that have bioactivity that can prevent or improve signs of aging such as wrinkles, sagging skin, hyperpigmentation, etc. so that the skin looks better [5]. One source of natural antioxidants is the carrot plant (*Daucus Carrota L*) which is processed into carrot seed oil. Carrot seed oil contains a lot of vitamin A and vitamin E due to the high levels of carotene and beta-carotene which are very good for maintaining the beauty of the skin [6].

Vitamin A is the main fat-soluble antioxidant in the body that functions to fight free radicals. Its regenerating properties of vitamin A protect the skin from aging and maintain its softness, smoothness, firmness, and elasticity [7]. Free radicals can trigger damage to cells that can lead to premature aging [8].Vitamin E is a fat-soluble vitamin that is very useful as an antioxidant but also protects the body from polyunsaturated fatty acids (PUFAs) such as oleic acid, linoleic acid, linolenic acid, and arachidonic acid. In addition, vitamin E in the body acts as an antidote to free radicals and oxygen molecules which are important in preventing membrane peroxidation of unsaturated fatty acids [9].

Vitamin E is an efficient scavenger of free radical-causing reactions in lipid membranes, because the free radical form is resonance stabilized. Therefore, the vitamin E radical has little tendency to extract a hydrogen atom from another compound and propagate the reaction. Vitamin E radicals can also be regenerated in the presence of vitamin C or glutathione [10]. As an antioxidant, vitamin E functions as a hydrogen ion donor capable of converting peroxyl radicals (products of lipid peroxides) into less reactive tocopherol radicals, so they are unable to damage fatty acid chains [11]. The antioxidant mechanisms of tocopherols include the transfer of one hydrogen atom from the 6-hydroxyl group to the chroman ring, as well as the inactivation of singlet oxygen and other reactive species. The phytyl tocopherol chain is bound to the bilayer cell membrane, while the active chroman ring is located on the cell surface. This unique structure causes tocopherols to work effectively as antioxidants, and can be regenerated through reactions with other antioxidants such as ascorbic acid [12].One of the delivery system technologies for cosmetic products is cream. Cream is a semi-solid dosage form containing one or more drug ingredients dissolved or dispersed in a suitable base material. The term has traditionally been used for semisolid preparations having a relatively liquid consistency formulated as water-in-oil or oil-in-water emulsions. intended for cosmetic and aesthetic use [13]. Based on the above background, the researchers conducted research on the development of carrot seed oil formulations in the form of cream in the hope of having better effectiveness as an antiaging. This research includes the formulation of carrot seed oil cream which evaluates the stability and anti-aging effectiveness of the preparation.

Carrot (*Daucus Carota L*)

Many vegetable plants can be used as medicinal plants, one of which is carrot (*Daucus Carota L.*). Carrot is a vegetable plant that has many uses for public health services in the world. Besides being rich in nutritional content, especially vitamin A and high antioxidants, it is also efficacious for healing various diseases as well as smoothing the skin and for beauty [14]. Carrot plants have several regional names, namely: Sunda (bortol), Java (carrot, carrot, and bortel), Madura (ortel) [15].Chemical content Fresh carrots contain water, protein, carbohydrates, fat, fiber, ash, anti-cancer nutrients, natural sugars (fructose, sucrose, dextrose, lactose, and maltose), pectin, glutathione, minerals (calcium, phosphorus, iron, potassium, sodium, magnesium, chromium), vitamins (beta carotene, B1, and C) and asparagine. The fruit contains bisabolen, tiglik acid, and geraniol. Wild carrot seeds contain flavonoids, volatile oils including asarone, carotol, pinene, and limonene [15]. Carrot leaves contain pectin, calcium, phosphorus, iron, potassium, sodium, magnesium, chromium, and asparagine. In addition, carrot leaves also contain saponins and tannins [14]. According to Rukmana [14] the taxonomy of carrot plants can be classified as follows: Kingdom: *Plantae*, Division: *Spematophyta*, Subdivision: *Angiospermae*, Class: *Dicotyledonae*, Order: *Umbelliferales*, Family: *Umbelliferae*, Genus: *Daucus*, Species: *Daucus Carota L.*Carrot seed oil is the oil extracted from carrot seeds where the carrot seeds are added to the base oil [16]. The content of carrot seed oil (Carrot Seed Oil) is *Bisabolene, Camphene, B. Pinene, Sabinene, Myrcene, Y. Terpinene, Limonene, Pinene, Geranylacetate and Carotene*. Carotene is one of the components found in carrot seed oil which comprises about 66% of the sesquiterpene essential oil [16].

Skin Structure

The skin is the outermost part of the body and is the widest organ, which is between 1.5-2.0 m^2 and weighs approximately 20 kg, while the part of the skin that is visible from the outside called the epidermis weighs 0.05-0.5 kg. [2]. Elastic wrapping skin is a tissue that covers the entire body and protects the body from environmental influences such as weather, pollution, air temperature, and sunlight. The skin layers are basically the same throughout the body, except for the palms of the hands, soles of the feet, lips [17]. The

skin consists of an outer layer called the epidermis and an inner layer or dermis layer, as well as a subcutaneous layer [17]. Human skin has several functions as maintenance, sensory organs, excretion, oil production, ergosterol, absorption, growth of nails and hair.

Signs of Premature Aging

Aging or aging is a process experienced by the body where the function of body parts decreases, for example, skin is getting thinner and then wrinkles appear, digestibility is decreasing and so on [18]. The organ responsible for the elasticity and smoothness of the skin is the epidermis. The epidermis layer is the first layer of the skin that serves as the foundation of collagen and elastin [19].The factors of thinning the outer skin layer at the age of 50 and above are due to exposure to sunlight, and the clumping of pigment cells (mellanocyte cells) causes the formation of blemishes on the skin and causes the skin to become dry [18]. 80% of skin aging is caused by photoaging. Photoaging is caused by ultraviolet (UV) light, which activates cytokines and metallo-protein collagenases and stimulates free radicals. Collagen and elastin (ELN) form cross-links in the skin, which results in loss of elasticity, thinning of the epidermis and causes the skin to become wrinkled [7]. There are several theories about the occurrence of the aging process in humans: Wear and Tear Theory, Neuro-Endocrine Theory, Free Radical Theory, Telomerase Theory and Genetic Control Theory [20]. The four physical signs of premature aging are uneven pigmentation of the skin, wrinkled and sagging skin, rough and scaly skin, and dry skin [2][19].

Anti-Aging

The products used to slow down the premature aging process are anti-aging products. Anti-aging is a technique to inhibit the process of damage to the skin (degenerative), so that it can inhibit the emergence of signs of aging on the skin [21]. The function of anti-aging products, namely: Supplying antioxidants to skin tissue, Stimulating the regeneration process of skin cells, maintaining skin moisture and elasticity, Stimulating the production of collagen and glycosaminoglycans, Protecting the skin from ultraviolet radiation [21].The benefits of anti-aging products, namely: Prevents skin from degenerative damage that causes skin to look dull and wrinkled, Skin looks healthier, brighter, and younger, and Skin looks supple, elastic, and far from signs of premature aging [21]

Cream

Cream is defined as a semi-solid dosage form, formulated as a water-in-oil or oil-in-water emulsion. Currently, it is more directed to products consisting of oil-in-water emulsions for cosmetic use [13]. Broadly speaking, cream consists of 3 components, namely active ingredients, basic ingredients and auxiliary ingredients. The basic ingredients consist of an oil phase in a water phase which is mixed with the addition of an emulsifier (emulsifier) which will then form a cream base. According to its use, anti-aging creams are classified as cosmetic treatments [21].In cream the ingredients used in the manufacture of anti-aging cream preparations are *Propylene Glycol* [22][23], *Triethanolamine* [22], *Cetyl Alcohol* [24], *Stearic Acid* [22] and *Nipagin* [22].

Skin Analyzer

Skin analyzer is a device designed to diagnose skin conditions. which not only covers the top layer of skin but is able to show the deeper side of the skin layer, using normal and polarized measurement modes, equipped with a series of camera sensors on the skin analyzer causing this tool to display results more quickly and accurately [24].A measurement that can be made using a skin analyzer are moisture (water content), evenness (fineness), pore (pores), spots (smudges), wrinkle (wrinkles), the depth of wrinkles is also detected with this tool [24].

II. METHODS

This research was conducted from September to November 2018. The research includes formulation of the preparation, examination of the homogeneity of the preparation, determination of the type of emulsion of the preparation, measurement of the pH of the preparation, determination of the stability of the preparation, skin irritation test of volunteers, and proving the ability of the preparation as anti-aging using 12 people. volunteer. Consisting of 4 test groups and each group consisting of 3 volunteers, 3 test groups each were given cream preparations with various concentrations of carrot seed oil formulated and 1 test group was

given blanks, which was carried out for 1 month. This research method was carried out experimentally.This research was conducted at the Central Laboratory of Palm Oil Research and the Cosmeticology Laboratory of the Faculty of Pharmacy, University of North Sumatra. The tools used in this study include a pH meter (pH 600 Milwaukee), skin analyzer and moisture checker (Aramo-SG), electric balance (Boeco Germany), porcelain mortar, stamper, glass object, glassware, vaporizer cup, water bath.The ingredients used in this research are carrot seed oil. The ingredients that will be used in research on the manufacture of anti-aging creams are *stearic acid, cetyl alcohol, triethanolamine, methyl paraben, sodium metabisulfite, aquadest*, carrot seed oil, *methyl blue*, acidic pH buffer solution (pH 4.01), and neutral pH (pH 7.01).

Anti-Aging Cream Formulations

The standard formulations of the anti-aging cream preparations selected were Stearic Acid 12 g, Cetyl Alcohol 0.5 g, Sorbitol 5 g, Propylene Glycol 3 g, Triethanolamine 1 g, Glycerin 1-5 drops, Methyl Paraben 1 Spoon Spatula, Parfum 1- 3 drops, distilled water 78.2 ml [26]. The anti-aging cream formula that will be made is Stearic Acid 12 g, Cetyl Alcohol 0.5 g, Triethanolamine 1 g, Methyl Paraben 0.1 g, Sodium Metabisulfite 0.1 g, Carrot Seed Oil x which will be added (3%, 6 %, and 9%) and distilled water 100 g.

Cream Preparation

Method of manufacture: Weigh all the ingredients needed. Separate the materials into two groups, namely the oil phase and the water phase. The oil phase consists of stearic acid, cetyl alcohol, melted on a water bath. The aqueous phase consisting of sorbitol, propylene glycol, triethanolamine and methyl paraben was dissolved in hot water which had been measured (mass II). Soak the porcelain mortar and pestle in hot water, then dry the mortar and pestle, put mass I into the mortar, then add mass II and grind it constantly until it forms a creamy mass. After the cream mass is formed in the hot mortar, add the carrot seed oil little by little, grind until a homogeneous cream is formed. Added 3 drops of perfume, homogenized until a creamy mass is formed. Preparation was carried out in the same way for all formulas with different concentrations of carrot seed oil.

Physical Quality Inspection of Preparations

A certain amount of the preparation when applied to a piece of glass or other suitable transparent material, the preparation must show a homogeneous arrangement and no visible coarse grains [13]. Determination of the type of emulsion is done by painting or staining. A certain amount of the preparation is placed on a glass object, added 1 drop of methyl blue, stirred with a stirring rod. If the methyl blue is evenly distributed, it means that the preparation is an o/w emulsion type, but if only blue spots are found, it means that the preparation is a w/o emulsion type [28].Measurement of the pH of the preparation was carried out using a pH meter. The instrument was first calibrated using a neutral standard buffer solution (pH 7.01) and an acidic pH buffer solution (pH 4.01) until the instrument showed the pH value. Then the electrode was washed with distilled water, then dried with a tissue. The sample was made in a concentration of 1%, which was weighed 1 g of the preparation and dissolved in distilled water up to 100 ml, stirred. Then the electrode is immersed in the solution. The pH value indicator is left until it is constant. The number shown by the pH meter is the pH of the preparation [30]. Observation of the stability of the preparation was carried out at room temperature storage by: Each cream preparation was put into a plastic pot, closed the top. Furthermore, observations were made when the preparations had been completed and stored for 1, 4, 8, and 12 weeks. The parts observed were phase separation, color change and odor of the preparation [31].

Irritation test was carried out with the aim of knowing the irritative properties of the preparation. The method used in this irritation test is the use test. This experiment was conducted on 12 volunteers using formula 1 (3%) by applying a cream preparation on the back of the volunteer's ear and then leaving it for 24 hours and observing the reaction. A positive irritant reaction is characterized by redness, itching, or swelling of the skin of the volunteers behind the treated ears [32].The anti-aging activity test used 12 volunteers and divided into four groups, namely: Group I: three volunteers for F0 cream (blank), Group II: three volunteers for FI cream (3 percent carrot seed oil concentration), Group III: three volunteers for FII cream (66% carrot seed oil), Group IV: three volunteers for FIII cream (9% carrot seed oil concentration). All volunteers measured initial facial skin conditions including: 1. Moisture content, 2. Evenness, 3. Pore size, 4. Number of spots, 5. Wrinkles using a skin analyzer according to the measurement parameters. After measuring the

initial skin condition, the treatment was started by applying cream evenly over the measured area, twice a day (morning and evening) for four weeks. Changes in skin condition were measured every week for four weeks using a skin analyzer.The research data were analyzed using the SPSS (Statistical Product and Service Solution) 21 program. The data were analyzed using the Mann-Whitney Test to analyze the effect of the three concentrations on skin condition for four weeks of treatment.

III. RESULTS AND DISCUSSION

Cream Formulation Results

Cream preparations with the addition of Carrot Seed Oil with concentrations of 3%, 6%, and 9%, respectively, were yellowish white in color. The higher the concentration, the more yellowish the cream color produced with white blank cream. The results of the examination of the fatty acid and vitamin E content in carrot seed oil consist of fatty acids: *Caprylic Acid, Capric Acid, Undecanoic Acid, Lauric Acid, Pentadecanoic Acid, Tridecanoic Acid, Palmitic Acid, Palmitoleic Acid, Stearic Acid, Linoleic, And Linolenic Acid*. Fatty acids such as Oleic acid, Linoleic acid, Palmitic acid, Palmitoleic acid, Stearic acid can be used in the manufacture of cream preparations as mentioned by previous researchers [27].

Homogeneity Check

From the results of the homogeneity test carried out on cream preparations of carrot seed oil with blank cream concentrations, 3%, 6%, and 9% where all cream preparations do not have coarse grains on the glass object, the cream preparation is said to be homogeneous. If the preparation is homogeneous and there are no grains on the glass pieces, then the preparation meets the requirements [13].

Determination of Emulsion Type in Cream Preparations

Based on the results of the tests carried out, the anti-aging cream of carrot seed oil has an o/w type because methylene blue can be dissolved and gives a homogeneous color. All cream preparations showed a homogeneous methyl blue color or evenly distributed in the cream so that it could be proven that the cream preparations had an oil-in-water (o/o) emulsion type. This type of emulsion has the advantage that it is easier to spread on the surface of the skin, is not sticky and is easily removed by washing. Determination of the type of cream preparation can be determined by methylene blue staining, if the methylene blue is evenly distributed, it means that the preparation is oil in water type, but if the color is only blue spots, it means the dosage type is water in oil [28].

Result of pH Measurement of Preparation

Measurement of the pH of the preparation was carried out after it was finished, then after the first week of storage until the 12th week. The results of pH measurements for each formula showed that with increasing concentration of carrot seed oil, the pH of the preparation was lower, but the change was still within the standard pH requirement for cream preparations, which was between pH 5-8 [29]. As for the comparison cream, there was no change in pH, so the normal skin pH value between 4.5 - 7.0 would not irritate the skin, meaning it was safe for the skin.

Results of Observation of Stability of Cream Preparations

Based on the results of the study, it shows that each cream preparation with a different formula concentration for 90 days gave good results, namely no change in color, odor and phase separation. This shows that carrot seed oil cream is stable in storage. The stability of a pharmaceutical preparation can be seen from the presence or absence of changes in color and odor during storage. These changes can occur if the ingredients contained in the preparation are oxidized. The emulsion preparation is said to be unstable if it undergoes creaming and inversion. According to Ansel, an emulsion becomes unstable due to agglomeration of the globules of the dispersed phase [31]. Whether or not an emulsion is damaged can be observed by a change in color and a change in odor. To overcome material damage due to oxidation, it can be done by adding an antioxidant.

Irritation Test Results on Volunteer's Skin

The results of the irritation test on volunteers' skin were applied to the thin skin behind the ears and behind the backs of the hands left for 24 hours [32]. Based on the results of the study, the results of the irritation test carried out on the volunteers' skin showed that there were no visible side effects in the form of

redness, itching and roughening of the skin caused by the preparation of carrot oil cream that was applied to the skin. Thus, it can be concluded that the preparation of carrot seed oil cream made is safe to use.

Anti-Aging Activity Test Results

Anti-aging effectiveness testing was carried out using the Aramo skin analyzer. The testing process is carried out up to 4 measurements. The data obtained on each anti-aging parameter were tested for normality with the Shapiro-Wilk test, p value was obtained 0.05, it can be concluded that the data were not normally distributed, so a non-parametric Kruskal Wallis test was carried out to determine whether there were differences between formulas in recovering the skin was then continued with the Mann-Whitney test to find out which formula there was a significant difference.

Water Content (Moisture)

Table 1. Data From the Measurement of Moisture

Formula	Volunteer	Moisture (%)				
		Initial Conditions	Usage (Week)			
			I	II	III	IV
Blank (cream base)	1	15	17	19	20	22
	2	20	20	21	24	26
	3	19	20	23	26	28
	Average	18	19	21	23,3	25,3
Cream of Carrot Seed Oil 3%	1	17	19	26	27	29
	2	20	23	25	25	26
	3	19	23	27	29	29
	Average	18,7	21,7	26	27	28
Cream of Carrot Seed Oil 6%	1	17	17	21	25	29
	2	23	26	28	29	31
	3	25	28	31	33	36
	Average	21,7	23,7	26,7	29	32
Cream of Carrot Seed Oil 9%	1	22	28	33	39	43
	2	25	26	35	40	45
	3	29	35	40	46	50
	Average	25,3	29,7	36	41,7	46

Note: Dry/Low < 36; Dry/Normal 37-39; Normal/Normal > 40-59

The results on the water content obtained showed good results in blanks and cream preparations with various concentrations. Where the increase in water content is one of the measurement parameters of anti aging cream. The results of measuring the moisture content on the volunteers' faces can be seen in Table 1.For the moisture content parameter (see table 1), it can be concluded that the graph of the skin given carrot seed oil cream experienced an increase in moisture, the greater the concentration given, the greater the effect of skin moisture obtained. As mentioned by previous researchers Draelos, this change is caused by the presence of Linoleic acid and Linolenic acid which can form a thin artificial fat layer on the surface of the skin, which serves to reduce the evaporation of water from the skin [5].

Subtlety (Evenness)

Table 2. The Results Of The Smoothness Measurement (Evenness) On The Volunteer's Facial Skin

Formula	Volunteer	Evenness (%)				
		Initial Conditions	Usage (Week)			
			I	II	III	IV
Blank (cream base)	1	44	42	41	41	39
	2	42	40	39	38	36
	3	41	40	38	37	37
	Average	42,34	40,67	39,33	38,67	37,33
Cream of Carrot Seed Oil 3%	1	56	48	42	36	30
	2	57	47	41	35	29
	3	53	47	40	34	30
	Average	55,33	47,33	41	35	29,66
Cream of Carrot Seed Oil 6%	1	53	45	38	28	20
	2	54	46	40	26	20
	3	58	44	38	27	21

	Average	55	45	38,66	27	20,33
Cream of Carrot Seed Oil 9%	1	53	43	34	28	19
	2	60	44	35	26	17
	3	59	46	32	24	17
	Average	57,33	44,33	33,66	26	17,66

Note: Requirements: Smooth: 0-21; Normal; 32-51; Rough; 52-100

After using carrot seed oil cream for 4 weeks, all formulas decreased. A decrease in facial skin roughness or equal to a greater increase in facial skin smoothness was shown by the group of volunteers treated using the Carrot Seed Oil Cream formula 9% better than Blank (cream base), 3% Carrot Seed Oil Cream and Carrot Seed Oil Cream 6 %.This is because carrot seed oil contains vitamin E as a high anti-oxidant which is also efficacious for smoothing the skin and for beauty [14] and carrot seed oil contains lauric and oleic acids which are capable of softening the skin and as skin hydration. very safe to use as a moisturizer.

Skin Pores

The use of carrot seed oil cream is to measure the pore by using it every day in the morning and evening. Where to use it by applying it to the volunteer's face. Pore measurement using a skin analyzer device. The measurement results can be seen in Table 3. Volunteers who used carrot oil cream with 9% carrot oil cream formula had a higher percentage of pore reduction.Large pores can be caused by sunlight and dead skin cells. Pores can enlarge when exposed to the sun that is too hot, an increase in temperature causes dirt to easily enter and become clogged in it, causing acne to occur more easily [21].

Table 3. Pore Measurement Data From Carrot Oil Cream On Volunteers' Faces

Formula	**Volunteer**	**Pore (%)**				
		Initial Conditions	**Usage (Week)**			
			I	**II**	**III**	**IV**
Blank (cream base)	1	36	34	32	30	29
	2	38	37	37	36	34
	3	40	38	37	37	35
	Average	38	36,3	35,3	34,3	32,7
Cream of Carrot Seed Oil 3%	1	40	39	36	32	28
	2	36	34	31	27	26
	3	32	29	27	27	24
	Average	36	34	31,3	28,7	26
Cream of Carrot Seed Oil 6%	1	36	35	24	20	18
	2	38	33	23	28	21
	3	35	29	24	20	19
	Average	36,3	32,3	23,7	22,7	19,3
Cream of Carrot Seed Oil 9%	1	40	34	30	21	13
	2	43	37	30	23	15
	3	38	31	25	19	14
	Average	40,3	34	28,3	21	14

This is where the Palmitoleic acid content plays a role as bactericidal in gram-positive staphylococcus aureus, streptococcus salivarius and gram-negative bacteria (Pseudomonas aeruginosa, Propionibacterium acnes, Escherichia coli). Palmitoleic acid can protect the skin from bacteria and as a natural preservative against gram-positive microbes in skin and hair care products [33].

Stains (Melanin)

For the results of Blank (cream base), 3% carrot oil seed cream, 6% carrot oil seed cream in good value still require intensive care while 9% carrot oil seed cream has a good value. This is due to the increased number of hypertrophied melanocytes as well as the melanin levels per unit resulting in freckles and hyperpigmentation [36].After using anti-aging cream for 4 weeks (see table 4), the results of measuring melanin in volunteers who used the Blank formula cream (cream base), 3% carrot seed oil cream, 6% carrot seed oil cream and 9% carrot seed oil cream, experienced a reduction in blemishes. This shows that the more carrot oil content in the cream preparation, the greater its role in reducing the number of blemishes on the skin caused by sunlight. The decrease in melanin levels on the faces of the best volunteers on carrot oil

cream concentration of 9% carrot seed oil cream.Beta carotene has two roles, namely as a precursor of vitamin A and antioxidant beta carotene contained in carrots has the potential as an antioxidant. Antioxidants are compounds that can provide protection against disease because they can neutralize free radicals [34].

Table 4. Data On the Results of Measuring Stains (Melanin) From Carrot Oil Cream on Volunteers' Faces

Formula	Volunteer	Stains (Melanin) (%)				
		Initial Conditions	Usage (Week)			
			I	II	III	IV
Blank (cream base)	1	45	45	43	40	38
	2	40	40	37	36	34
	3	43	43	40	38	35
	Average	42,7	42,7	40	38	35,7
Cream of Carrot Seed Oil 3%	1	39	35	33	27	37
	2	43	41	37	35	30
	3	40	37	34	32	27
	Average	40,7	37,7	34,7	31,3	31,3
Cream of Carrot Seed Oil 6%	1	45	43	40	38	25
	2	37	35	34	33	27
	3	35	33	32	30	28
	Average	39	37	35,3	33,7	26,7
Cream of Carrot Seed Oil 9%	1	43	37	29	22	17
	2	38	30	21	18	12
	3	48	43	32	23	16
	Average	43	36,7	27,3	21	15

Wrinkles

In 4 weeks, the results of measuring wrinkles in all groups of volunteers who used carrot oil cream experienced a significant change (see table 5). Where the results showed that the concentration of 9% carrot seed oil cream was better at reducing the number of wrinkles that the volunteers had.With increasing age, skin collagen begins to stiffen and break so that the skin loses its elasticity which causes the skin to look wrinkled and rough [19]. This reduction in wrinkles is due to the ability of topical vitamin E and its derivatives to inhibit lipid peroxidation induced by UV radiation, anti-oxidants can block the formation of reactive oxides induced by UV rays and further potentiate anti-implantation and anti-aging [35].

Table 5. Wrinkle Measurement Data from Carrot Oil Cream on Volunteers' Faces

Formula	Volunteer	Wrinkle (%)				
		Initial Conditions	Usage (Week)			
			I	II	III	IV
Blank (cream base)	1	33	33	33	31	31
	2	34	34	33	31	31
	3	37	37	35	35	33
	Average	34,7	34,7	33,7	32,3	31,7
Cream of Carrot Seed Oil 3%	1	39	37	35	33	31
	2	35	33	29	27	26
	3	37	34	33	29	28
	Average	37	34,7	32,3	29,7	28,3
Cream of Carrot Seed Oil 6%	1	31	29	21	19	16
	2	35	31	28	25	19
	3	38	35	24	21	17
	Average	34,7	31,7	24,3	21,7	17,3
Cream of Carrot Seed Oil 9%	1	35	31	26	17	11
	2	37	32	25	16	9
	3	41	35	29	14	7
	Average	37,7	32,7	26,7	15,7	9

IV. CONCLUSIONS AND RECOMMENDATIONS

Carrot seed oil can be formulated in a homogeneous cream dosage form with an oil-in-water emulsion type, pH 6.7-7.7; does not cause skin irritation and is stable on storage for 90 days at room temperature.Carrot seed oil cream with a concentration of 9% showed the best anti-aging effectiveness by increasing water content, reducing skin hardness, shrinking pores, reducing blemishes and reducing wrinkles compared to other cream formulas.It is hoped that further researchers will be able to test the antibacterial activity of carrot seed oil cream preparations and be able to use solvents other than 96% ethanol such as ethyl acetate.

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