Test Of the Effectiveness of Tomato (*Lycopersicum Esculentum Mill*) Fruit Extract Cream on Increasing Elasticity, Sebum and Hydration in White Mouse Skin (*Mus Musculus*)

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Abstract.
The skin is the outermost organ that acts as a protector from the external environment both in the ligaments, muscles, and internal organs from exposure to direct sunlight (ultraviolet light) and dehydration, also functions as a sense of taste and touch as well as a defense against pressure and infection. The imbalance between oxidants and antioxidants is influenced by external factors and internal factors that will affect wrinkling and aging of the skin. Tomatoes contain substances such as citrulline, vitamin A, vitamin B2, vitamin B6, vitamin E, vitamin C, and protein, beta-carotene, lycopene, and water. The purpose of this study was to determine the activity of tomato fruit ethanol extract to increase elasticity, sebum and hydration in the skin of male white mice. Cream preparations of tomato fruit ethanol extract were formulated with concentrations of 2.5%, 5%, and 10%. The test was carried out on the skin of male mice for 4 weeks by measuring the levels of elasticity, sebum and hydration. The results of phytochemical screening of extracts contained flavonoids, saponins, steroids, triterpenoids, and glycosides. The measurement results in the fourth week of each group of cream preparations showed an increase in the levels of elasticity, sebum and hydration and was significantly different from the blank group ($p<0.05$) and the highest increase occurred in cream with 10% tomato extract concentration. The results of this study indicate that the preparation of tomato fruit ethanol extract cream can increase the elasticity, sebum and hydration levels of the skin.

Keywords: *Tomato, Elasticity, Sebum, Hydration and Anti-Aging.*

I. INTRODUCTION

The skin is the widest and outermost organ that acts as a protector from the external environment which has a function as a protector of ligaments, muscles, and other internal organs from exposure to direct sunlight (ultraviolet light) and dehydration. The skin also functions as a sense of taste and touch as well as the body's defense against pressure and infections that come from outside the body [1]. However, these skin functions can be disrupted due to problems related to the imbalance between oxidants and antioxidants which is influenced by various factors, namely external factors (free radicals, sunlight, and pollutants) and internal factors (health, reduced body structure). elastin and collagen in the skin, the immune system, hormonal changes) which in turn will cause damage to cells and will also affect the occurrence of wrinkling and aging of the skin [2][3].The aging process is a physiological process that always occurs in every living thing. Aging is a process of slowly disappearing the ability of the tissue to repair itself and maintain its normal structure and function so that it cannot repair the deficiency suffered. This process includes all organs that can directly show the aging process [4][5]. Premature aging can occur at productive age, which is characterized by symptoms such as dry, rough scaly skin accompanied by the appearance of wrinkles, sagging quickly, and black spots or spots [6]. Skin aging caused by internal factors is defined as natural aging and is stimulated by changes in skin elasticity. Collagen is a protein found in the top layer of the skin that serves to attach connective tissue that is found in the extracellular matrix (ECM).

If this protein is damaged, it causes changes in the composition of skin tissue so that it can cause the aging process [7]. External factors of the aging process mostly come from free radicals. These free radicals will induce the formation of ROS (Reactive Oxygen Species).ROS are free radicals against protein molecules, DNA, cell membrane lipids, and other cell or tissue components. Free radicals are atomic molecules that have unpaired electrons [8] (Cheeseman & Slater, 1993). The formation of this ROS, if produced in excess, causes oxidative stress. Oxidative stress is an imbalance between the amount of ROS and oxidant activity in the body. Severe oxidative stress can cause damage to cells and cause cell death [6] (Polsjak & Dahmane, 2012).Aging of the skin usually begins to appear when entering adulthood around the

age of 30. However, a survey revealed, as many as 57% of women in Indonesia are already aware of the signs of aging at the age of 25 years. Even though they are aware of the signs of premature aging, there are still many of them who delay anti-aging treatments. Another survey conducted by the independent research agency Taylor Nelson Sofres on 1,800 women aged 20-39 years in Asia (India, Korea, Philippines, Thailand) reported that 1 in 3 women in Asia only use treatments for whitening, although they also experience symptoms of whitening. signs of aging. Clinical data based on research entitled "The Effects of Skin Color Distribution and Topography Cues on The Perception of Female Facial Age and Health" states that women with wrinkles and uneven skin tone will look six years older than their actual age. In Indonesia itself, women are more concerned with skin that only looks white without paying attention to their health. Even though white skin is not always healthy. Indicators of healthy skin are usually seen from bright skin without blemishes with a natural reddish hue.

An 8-year study published in the British Journal of Dermatology has shown that using skin care early can reduce the signs of aging. The study also revealed that with proper care, the development of fine lines and wrinkles can be reduced.In today's era, technological advances have developed rapidly, especially in the field of beauty. The development of beauty technology is supported by the results of research on the increasing life expectancy. In the United States, it is estimated that 31% of the population is 55 years of age or older by 2030 [5] and the number of elderly people will double or even triple during the first quarter of the 21st century [9]. In Indonesia, according to data from the Central Statistics Agency, in the period 2000-2005 the life expectancy of the Indonesian population (male and female) was 67.8 years, in the period 2020-2025 it increased to 73.6 years (Statistical Data Indonesia, 2011). This encourages the increasing interest and concern of people in efforts to slow down the aging process [5].Currently, awareness to look better, one of which is having healthy facial skin and looking young has become a necessity and has an impact on a person's quality of life [4]. Skin disorders due to the aging process that used to be considered not a cosmetic problem are now often complained of and feared by the public. In the United States tens of millions of dollars are spent annually on the care and treatment of antiaging products [5]. One way to protect the skin from oxidation damage and the aging process is the use of antioxidants that can be consumed through foods such as vitamins A, C, E from vegetables or fruits [10] and derived from natural ingredients, one of which is tomatoes.Tomato (*Lycopersicum Esculentum Mill*) is a plant that contains high antioxidants, so it can be relied on as a free radical neutralizer and reduce cell damage in the body [11].

The content of antioxidants found in the skin of tomatoes include vitamin A, vitamin B2, vitamin B6, vitamin E, vitamin C, and a lot of protein. While beta-carotene and lycopene found in tomatoes can be used as antioxidants and tighten facial skin and prevent the appearance of acne. wrinkles on the face [12]. Tomatoes contain a lot of water (about 92%) and contain lycopene by 48.8% [13]. The use of tomatoes as a cosmetic cream preparation is a new innovation where the cream with concentrated tomato skin juice is safer to use because it is sourced from natural ingredients and contains antioxidant activity. Based on the above, the authors are interested in conducting research on the formulation of anti-aging cream from tomato fruit extract.

II. LITERATURE REVIEW

Skin

The skin is an organ of the human body that is very important because it is located on the outside of the body which functions to receive stimuli such as touch, pain and other influences from the outside [14]. Skin that is not maintained healthy can cause various skin diseases so it is necessary to maintain skin health from an early age to avoid disease. Skin diseases can be caused by several factors such as the environment and bad daily habits, climate change, viruses, bacteria, allergies, immune systems and others [15]. According to Lockhart, the skin consists of three main layers (Epidermis, Dermis and Hypodermis) [16], anatomically, the epidermis consists of five layers (*Stratum Germinativum, Stratum Spinosum, Stratum Granulosum, Stratum Lucidum and Stratum Corneum*). Then the dermis layer is the layer below the epidermis which is much thicker than the epidermis which is divided into two parts, namely *Pars Papillare* and *Pars Reticle*. And the Hypodermis layer is a looser connective tissue with fine collagen fibers oriented parallel to the skin

surface. The hypodermis often contains fat cells that form the panniculus adiposus layer whose number varies according to the body area and is more abundant than the dermis [17][18]. The most surface cells of the stratum corneum are dehydrated horny scales that are always exfoliated [17].The skin has various functions to adapt to the environment. The main functions of the skin are as a protection function, as an absorption function, as an excretion function, as a perception function, as a body temperature regulation function (thermoregulation), as a pigment formation function and as a creatinization function [19]. The types of skin in humans will vary depending on environmental conditions and heredity. The use of skin products that are not appropriate with the classification of skin types will cause damage to the skin.

Skin types can be divided into normal skin, dry skin, oily skin and combination skin [20]. *Elastin* is an important part of various human tissues that require elasticity properties. These tissues include the skin, lungs, and arteries. *Elastin* provides this elastic tissue with the ability to stretch and plays an important role in supporting and maintaining other cells [21]. There are fewer elastin fibers in the dermis than collagen, but they play an important role in maintaining skin elasticity and resilience, keeping the skin back in shape as soon as the skin is stretched. Histologically, *Elastin* fibers are divided into three groups, namely *Oxytalan*, *Elaunin*, and *Elastic*. *Oxytalan* is on the outermost surface, is very thin and extends from perpendicular to the dermal-epidermal junction, while *Elaunin* and *Elastic* are in a deeper and thicker layer. When the skin undergoes photoaging, *elastin* changes shape and function to become thick and irregular. *Elastic* tissue can cause clinical manifestations of skin aging, namely the skin looks loose or has reduced elasticity [22].Collagen is a triple helical protein found in all parts of the body and functions as tissue binding, cell attachment, cell migration, new blood vessel formation (angiogenesis), tissue morphogenesis, and tissue repair. Collagen in vertebrates consists of 28 types which are numbered I-XXVIII. Collagen in the skin is collagen types I, III, V, and VI which form a horizontal structure in the dermis, interspersed with elastin fibers. Type I collagen is the most abundant type in the connective tissue of the skin. Proteoglycans, especially hyaluronic acid, are amorphous substances surrounded by collagen and elastin fibers [23]. Collagen I is synthesized in fibroblast cells through two processes, namely internal and external processes. In the intracellular process, procollagen is first formed in the form of two alpha peptide chains on translation on the ribosomes along the rough endoplasmic reticulum (RER).

Then the polypeptide chain is released into the lumen of the RER. The signal peptide is released to the RER, so that the peptide chain becomes a pro-alpha chain. Furthermore, the lysine and proline amino acids hydroxylation process in the lumen with ascorbic acid cofactor occurs. Then the hydroxylysine residue is glycosylated. Inside the endoplasmic reticulum, a triple alpha helix is formed. The procollagen is then exocytosed into the Golgi apparatus. In the extracellular process, exocytosed procollagen is further converted into tropocollagen by procollagen peptidase. Some tropocollagen forms collagen fibrils to form collagen fibers. Collagen is then attached to the cell membrane through several proteins, including fibronectin and integrins [17].The outermost layer of the epidermis of the skin – the stratum corneum (SC) is responsible for the skin barrier function. A healthy SC will provide functional properties as an effective transport barrier, and soft, strong, and flexible properties to tolerate deformation from physical stress and stress. SC is also a material that responds and its properties can be changed by changes in the skin environment. SCs are 10-15 nm thick and consist of nucleated dead cells (corneocytes) filled with keratin filaments and wrapped in a cornified envelope. Keratin filaments have a rigid core with a protruding terminal portion and consist of bound protofilaments which are classified as “intermediate filaments” because of their size range of 10-15 nm, which is intermediate compared to cytoskeletal actin filaments (6 nm) and microtubules (24 nm). The intermediate filament is present in all parts of the skin, hair, and nails where it acts as a mechanical scaffold. Filament structures of similar size are also found in neurofilaments in neuronal cells [24]. Hydration also causes an increase in SC permeability under conditions of relatively high humidity. It is utilized in dermal and transdermal drug delivery, which is called “occlusion”. In occlusive conditions, the penetration of chemicals into the skin, for example skin patches or creams can be increased [24].

Skin Aging

Skin aging is the process of slowly losing the ability of tissues to repair or replace themselves and maintain their normal structure and function, which makes the body unable to withstand the damage or repair

the damage [25]. Efforts to slow down the aging process aim to increase life expectancy and active life expectancy, namely disease-free conditions even at an advanced age (NIH, 2010). Life is always synonymous with increasing age; someone will live longer. This is due to the combination of adequate, healthy and hygienic food and better health services, besides that fewer people work in hazardous environments or heavy physical burdens. There are people who reach old age without any problems but there are also those who get more problems related to aging and disease. With increasing age, the condition and appearance of human skin will change. Changes in the structure, reduced firmness, smoothness, and decreased functional ability of the skin are phenomena that accompany aging of the skin. Increased dryness and roughness of the skin as well as loss of firmness and even skin tone are also signs of increasing aging of the skin [26].According to Goldman and Klatz (2007), the aging process is caused by several factors, including: excess activity (Wear and Tear Theory), hormonal (Neuroendocrinology Theory), genetics (The Genetic Control Theory), and free radicals (The Free Radical Theory). Wear and Tear Theory; This theory states that organs will be damaged if they are used excessively and the more often, they are used excessively, the more will be damaged so that the body is unable to repair.

The Neuroendocrinology Theory is the inability of hormone production to compensate for its excessive function so that the body will experience a complete lack of hormones resulting in the aging process. Although the feedback mechanism starting from the hypothalamus, pituitary and target organs is still working, due to excessive work, the hypothalamic-pituitary axis and target organs are still unable to compensate and eventually the aging process will occur. The Genetic Control Theory is genetic control regulates humans according to what has been arranged in a person's DNA, but now various advances in medical science, especially in the field of anti-aging medicine have begun to be explored to break the chain of DNA to prevent damage and repair DNA. The Free Radical Theory; Free radicals are believed to be one of the elements that accelerate the aging process, so based on this theory, the formation of excessive free radicals must be avoided immediately.In essence, getting old is a natural process which means that a person goes through 3 stages of life, namely childhood, adulthood, and old age [27]. Entering old age means a decline physically and psychologically. Physical decline will be characterized by loose skin, white hair, decreased hearing, decreased vision, slow movement, abnormalities in vital organ function, increased emotional sensitivity. According to Padila, the aging process becomes an influence in the lives of the elderly. Many changes occur in all aspects of the life of the elderly, and every change requires adjustment, even though in reality the older we get, the less flexible we are in adjusting to various changes [28]. According to Fowler (2003) aging is divided into 3 phases, namely: the subclinical phase (age 25-35 years), the transition phase (age 35-45 years) and the clinical phase (age 45 years and over) [29].

There are several factors that affect a person's age, including lifestyle and 64% of the causes of death are caused by lifestyle [30]. Lifestyle determines the aging process and this lifestyle always adapts to the condition of the elderly, so the elderly themselves must determine a healthy lifestyle for themselves. In addition, when someone does an activity where the workload exceeds the work capacity, free radicals begin to occur in addition to a decrease in some hormone levels so that this situation will accelerate the skin aging process [31].

Aging Prevention

The decrease in hormone levels is caused by several factors, including too much use of hormones so that the organs that produce hormones are not normal, this situation is often reported in several circumstances, for example in some athletes who often do excessive (over training) and over-work (over-working). Lack of sleep, restlessness and stress will cause several hormones to increase, especially stress hormones including adrenaline and cortisone [25][30]. Some facts in everyday life that accelerate the aging process are that sports for children have been equated with achievement sports and children are forced to achieve untimely targets [25]. Reducing fat and carbohydrate intake and getting enough exercise will reduce the metabolic rate so that the production of free radicals that cause premature aging will be reduced and antioxidants in the body will increase [32].

Anti aging or anti aging is a topical cosmetic product that is able to treat or eliminate the symptoms of aging on the skin caused by the sun's ultraviolet rays (photo aging) or it can be said that a product that can

reduce or slow down the onset of symptoms of photo aging [33]. The function of anti-aging is to supply antioxidants to skin tissue, stimulate the regeneration process of skin cells, maintain skin moisture and elasticity, and stimulate collagen production. While the anti-aging benefits include: Others prevent degenerative damage that causes the skin to look dull and wrinkled, making the skin look healthy, tight, bright, elastic, and youthful [34].Skin analyzer is a device designed to diagnose skin conditions. An additional series of camera sensors installed on the skin analyzer displays results quickly and accurately [35]. According to Aramo, several measurements that can be made using a skin analyzer, namely: moisture (water content), evenness (fineness), pore (spots), spots (smudges), wrinkle (wrinkles), and depth of wrinkles [35]. Skin measurements using a skin analyzer will automatically display results in the form of numbers and the numbers obtained will be directly adjusted to the parameters of each measurement that have been set in such a way on the tool.

Tomato (*Lycopersicum Esculentum Mill*)

Tomato (Lycopersicum esculentum mill) is a plant originating from Africa, when it is in season the tomatoes will be abundant. Tomato is a fruit that is very popular with Indonesian people because of its sweet taste and high-water content. Tomatoes originating from the Kalahari Desert in Africa, then spread to all corners of the world, especially in tropical and sub-tropical areas ranging from Japan, China, Taiwan, Thailand, India, Germany, the Netherlands, even to America (Prajnanta, 2003). Tomato (Lycopersicum esculentum mill) classifications include: Kingdom: *Plantae*, Division: *Spermatophyta*, Subdivision: *Angiospermae*, Class: *Dycotiledonae*, Order: *Pleomoniales*, Family: *Solanaceae*, Genus: *Lycopersion*, Species: *Lypersion Esculentum Mill.*

Tomato is one of the plants that contain high antioxidants so that it can be used as a free radical neutralizer and reduce cell damage in the body. The content of beta-carotene and lycopene in tomatoes can be used as antioxidants and tighten facial skin and prevent wrinkles on the face [12]. Tomatoes also contain many substances that are useful for health, one of which is citrulline. Citrulline is one of the antioxidants that are beneficial for skin health [11]. Utilization of tomatoes is currently classified as still less than the maximum. A layer of tomato fruit extract is useful as an anti-aging that can be formulated as a cream. Cream preparations were chosen because they are preferred over ointments, are associated with ease of use, and are less dirty or greasy [36].

III. METHODS

The type of research carried out is non-experimental and experimental research using a pre-test post-test control group design. The non-experimental research included tomato fruit determination, extraction, and preparation of anti-aging cream using red tomato fruit extract at a concentration of 2.5%, 5%, and 10%. Experimental research includes testing of anti-aging activity on male white mice.The research variables used were as follows: Independent variables: red tomato fruit extract, Dependent variable: water content and collagen content, Controlled variables: sex of mice, food and drink of mice, area of back of mice smeared with red tomato fruit extract. The time of the research was carried out from May 2019 – June 2019. The research location was at the Pharmacist White Rat Laboratory, Jalan Ngumban Surbakti, Elisabeth Nurse Academy Simpang, Medan.The sample in this study was mice (Mus musculus) obtained from the White Rat laboratory, Medan. The mice that were sampled had a body weight of about 25-30 grams per head, with ages ranging from 11-12 weeks. The overall sample size used in this study was 24 individuals. The sample is calculated by the Federer formula. Of the 24 mice, they were divided into 4 test groups, each of which consisted of 6 mice.The plant material used is tomatoes. Making red tomato fruit extract is done by maceration using 70% ethanol solvent which refers to the maceration method carried out by Pratiwi [37]. Then do the examination of Alkaloids. Until positive Alkaloids were obtained if there was a precipitate or turbidity in two of the three experiments [38].

Furthermore, the examination of Tannin Examination, if a blue or blackish green color occurs, it indicates the presence of tannins [39], then check for saponins, until foam is formed as high as 1-10 cm which is stable for no less than 10 minutes and the foam does not disappear with the addition of 1 drop. 2 N hydrochloric acid indicates the presence of saponins [38]. Furthermore, Flavonoid Examination, until

positive flavonoids are obtained if there is a red, yellow, orange color on the amyl alcohol layer [39]. Then Triterpenoid Examination, if a purple or red color is formed which changes to blue purple or blue green, it indicates the presence of triterpenoids/steroids [39]. Then the Glycoside Examination, if a purple ring forms at the boundary of the two liquids, indicates the presence of sugar bonds [38]. The concentration of red tomato extract used in the manufacture of anti aging cream preparations were 2.5%, 5%, and 10%, respectively. The cream base formulation without red tomato fruit extract was made as a blank.The data on the anti-aging activity of red tomato fruit extract were analyzed using the SPSS 25 program. The data were tested for normality with the Shapiro-Wilk test and for homogeneity with the Levene's test. If the data is normal and homogeneous, then the data will then be tested with the Repeated Anova Test, followed by the Pearson correlation test and Multiple Linear Regression. If the data is not normal, then the test uses the Kruskal-Walli's test analysis followed by the Mann-Whitney test and the Multiple Linear Regression Test.

IV. RESULTS AND DISCUSSION

The results of phytochemical screening showed the presence of flavonoids, tannins, saponins, terpenoids, glycosides and alkaloids. The results of phytochemical screening of tomato fruit ethanol extract can be seen in table 1.

Table 1. Results Of Phytochemical Screening Of Tomato Fruit Ethanol Extract

No	Secondary Metabolites	Results
1	Flavonoids	+
2	Tannins	-
3	Saponins	+
4	Steroids	+
5	Terpenoids	+
6	Glycoside	+
7	Alkaloids	-

Anti-aging cream preparations were made using a standard formula (Schmitt, 1996) which was modified by removing several ingredients and adding ethanol extract of tomatoes. The ethanol extract of tomato used in this cream preparation is a concentration of 2.5%, 5% and 10%. The preparation obtained was in the form of a brownish cream, homogeneous and odorless.

Table 2. Results Of Measuring Elasticity Levels

Group	Begin Condition	1st Week	2nd Week	3rd Week	4th Week	% Increase
	AVG ± SD	AVG ± SD	AVG ± SD	AVG ± SD	AVG ± SD	
Blanko	47,17 ± 1,47	47,50 ± 1,05	48,00 ± 0,89	48,83 ± 1,17	48,83 ± 0,75	3,58
P Value*	-	-	-	-	-	
Cream 2,5%	48,00 ± 0,89	49,50 ± 0,55	51,50 ± 1,38	53,50 ± 1,87	55,50 ± 0,55	15,66
P Value*	0,686	0,122	0,009*	0,016*	0,002*	
Cream 5%	48,50 ± 1,05	53,33 ± 1,21	57,00 ± 0,89	61,00 ± 0,89	62,67 ± 1,21	29,25
P Value*	0,312	0,000*	0,000*	0,000*	0,000*	
Cream 10%	47,33 ± 1,63	53,50 ± 2,43	58,67 ± 2,81	63,33 ± 4,23	68,33 ± 5,05	44,36
P Value*	0,996	0,000*	0,000*	0,000*	0,000*	

Note: * there is a difference with the blank group

Very poor : 15-35%; Less : 35-50%; Normal :50-65%: Fair : 65-70%: Good : >70%

From the table above, it can also be seen that the cream with 10% tomato peel ethanol extract concentration had the highest percentage increase, which was 44.36%, followed by the cream group with 5% tomato fruit ethanol extract concentration, which was 29.25%. cream with a concentration of 2.5% tomato peel ethanol extract, which is 15.66%. Meanwhile, the lowest percent increase was owned by the blank group, which was 3.58%.From the table above, it can also be seen that at the beginning of the measurement, each group had less elasticity, namely 35-50%. After smearing, each week the cream group of tomato ethanol extract in each group increased and entered the normal category (50-65%). Meanwhile, in the cream

group with 10% tomato fruit ethanol extract at week 4 it was included in the sufficient category (65-70%). This shows that the higher the concentration of ethanol extract of tomato fruit, the higher the ability of the cream preparation to increase skin elasticity levels.

Table 3. Results Of Measuring Sebum Levels

Group	Begin Condition	1st Week	2nd Week	3rd Week	4th Week	% Increase
	AVG ± SD	AVG ± SD	AVG ± SD	AVG ± SD	AVG ± SD	
Blanko	3,50 ± 0,55	3,67 ± 0,82	3,50 ± 0,55	4,00 ± 0,89	4,00 ± 0,89	13,89
P Value*	-	-	-	-	-	
Cream 2,5%	4,00 ± 0,89	4,50 ± 1,05	4,50 ± 1,05	4,67 ± 1,03	5,33 ± 1,21	35,00
P Value*	0,394	0,180	0,065	0,132	0,093	
Cream 5%	4,5 ± 0,55	5,33 ± 0,82	6,00 ± 0,63	6,67 ± 0,52	7,17 ± 0,75	60,00
P Value*	0,026*	0,015*	0,002*	0,002*	0,002*	
Cream 10%	4,00 ± 0,89	5,33 ± 1,03	5,83 ± 1,72	6,00 ± 1,41	6,83 ± 1,60	70,56
P Value*	0,394	0,0015*	0,004*	0,0026*	0,009*	

Note: * there is a difference with the blank group

Balanced : 3-6%; Normal : 6-7%; Perfect :7-9%: High : 9-25%; Very high : > 25%

From the table above, it can also be seen that the cream with 10% tomato ethanol extract concentration had the highest percentage increase, which was 70.56%, followed by the cream group with 5% tomato ethanol extract concentration, which was 60.00%, then the cream group. with tomato fruit ethanol extract concentration of 2.5%, which is 35.00%. While the lowest percent increase was owned by the blank group, which was 13.89%.From the table above, it can also be seen that at the beginning of the measurement, each group had a balanced sebum level of 3-6%. After smearing, each week the cream group of tomato ethanol extract in each group increased and entered the normal (6-7%) and perfect (7-9%). This shows that the higher the concentration of ethanol extract of tomato fruit, the higher the ability of the cream preparation to increase skin sebum levels.

Table 4. Results Of Measuring Hydration Levels

Group	Begin Condition	1st Week	2nd Week	3rd Week	4th Week	% Increase
	AVG ± SD	AVG ± SD	AVG ± SD	AVG ± SD	AVG ± SD	
Blanko	25,17 ± 1,17	26,17 ± 1,17	27,00 ± 0,89	28,00 ± 0,89	29,00 ± 0,89	15,41
P Value*	-	-	-	-	-	
Cream 2,5%	26,00 ± 0,89	29,50 ± 1,05	33,67 ± 1,75	35,17 ± 2,86	37,33 ± 2,58	43,71
P Value*	0,777	0,016*	0,000*	0,000*	0,000*	
Cream 5%	26,50 ± 1,87	31,00 ± 2,00	34,83 ± 2,71	38,50 ± 2,35	41,83 ± 2,93	58,08
P Value*	0,442	0,001*	0,000*	0,000*	0,000*	
Cream 10%	26,50 ± 1,64	31,67 ± 2,16	37,50 ± 1,87	43,33 ± 1,97	48,50 ± 1,87	83,32
P Value*	0,442	0,001*	0,000*	0,000*	0,000*	

Note: * there is a difference with the blank group

Dry : 3-4%; Less : 4-10%; Normal 10-15%;High: 15-30%; Very high : >30%

From the table above, it can also be seen that the cream with 10% tomato ethanol extract concentration had the highest percentage increase, which was 83.32%, followed by the cream group with 5% tomato fruit ethanol extract concentration, which was 58.08%, then the cream group. with a concentration of 2.5% tomato fruit ethanol extract, which is 43.71%. Meanwhile, the lowest percent increase was owned by the blank group, which was 15.41%.From the table above, it can also be seen that at the beginning of the measurement, each group had a high hydration level of 15-30%. After smearing, each week the cream group of tomato ethanol extract in each group experienced an increase and entered the very high category (> 30%). This shows that the higher the concentration of ethanolic extract of tomato fruit, the higher the ability of the cream preparation to increase skin hydration levels.

V. CONCLUSIONS AND RECOMMENDATIONS

Tomato fruit ethanol extract has activity on increasing elasticity in male white mice skin and the best concentration is cream preparation with 10% tomato fruit ethanol extract concentration with an average elasticity value of 68.33 ± 5.05 and a percentage increase of 44 ,36%.Tomato peel ethanol extract has activity on increasing sebum levels in male white mice skin and the best concentration is cream preparation with 10% tomato peel ethanol extract concentration with an average sebum level of 6.83 ± 1.60 and an increase of 6.83 ± 1.60. 70.56%.Tomato fruit ethanol extract has activity on increasing hydration levels in male white mice skin and the best concentration is cream preparation with 10% tomato fruit ethanol extract concentration with an average sebum level of 48.50 ± 1.87 and a percent increase of 83 .32%Further research needs to be done with the same sample but on objects of different sexes to assess the effect of free radicals on increasing anti-aging activity and also further research is needed using different measuring instruments and also different parameters

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