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Utilization of BSF-Cream for Antiaging Impact on Human Skin

Vitthalrao Bhimasha Khyade[1]*, Shinya Yamanaka[2], Rajkumar Bajolge[3]

[1]Department of Zoology, Sharadabai Pawar Mahila Arts, Commerce and Science College, Sharadanagar Tal. Baramati Dist. Pune – 413115 India.
[2]Gladstone Institute of Cardiovascular Disease, SAN FRANCISCO, CA 94158, USA.
[3]School of Atmospheric Stress Management, ICAR-National Institute of Abiotic Stress Management, Malegaon, Kh. Baramati, Pune Dist. 413 115 (MS), India.

ABSTRACT

The most significant and revolutionary influencing field of aging treatment is the dermatology branch of health science. The endogenous factors as well as exogenous factors are responsible for the aging process. The gene mutations, cell metabolism, and hormonal balance are the endogenous factors associated with the aging process. Ultraviolet radiation, pollution-causing chemical compounds, and toxic compounds are the exogenous factors associated with aging. Decline the efficiencies of the body and metabolic activities soon after reaching the stage of maturity are associated with the phase of aging. The antiaging potentials of BSF cream have been assessed in the present research work. The method of dansyl-chloride-fluorescence has been utilized for the evaluation of the BSF cream for the renewals of the histological layers of skin. The present attempt is recording sixty days for the disappearance of stained patches in the control group. The percent decline in the intensity of fluorescence for the control group, the BSF-Cream treated group, and the group treated with retinol cream on the twenty-fifth day after the application were 42.582 (±7.786), 03.456 (±0.786), and 00.741 (±0.054), respectively. Improvement in skin renewal with BSF cream is substantial (at $P<0.05$), according to the statistical test (t-test). BSF-Cream deserves significant action on skin renewal and exerts potential antiaging efficiencies. BSF-Cream is going to open a new avenue in the fields of technology of antiaging for human life.

Keywords: BSF-Cream, BSF-Meal, Pre-pupae, Dancylchloride, BSF.

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Corresponding author: Vitthalrao Bhimasha Khyade
E-mail ✉ vbkhyade.2016@gmail.com
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INTRODUCTION

The largest organ of the body of most of the animals is skin. It covers the entire outer (external) surface of the body. The skin serves a lot for protection, support, and flexibility of the organs of the body, the outermost concerning histology, chordate skin is with three layers: epidermis, dermis, and hypodermis. All these three skin layers vary significantly concerning their anatomy and functions. An intricate network of the structure of the skin serves as the very first barrier against pathogens, ultraviolet light, chemical compounds, and mechanical injuries. In addition, the regulation of the temperature of the body and the release of a quantity of water from the body into the surrounding atmosphere are the two significant functions of the skin. The relevant anatomical structure of the epidermal layer of skin, its structure, functions, embryology, vascular supplies, innervations, surgical consideration, and clinical relevance are the factors to be considered in the detailed study. The significant functions of the skin are classified as protective functions, regulative functions, and sensitive functions [1]. In healthy conditions, the skin serves significantly for protection. There is compromised abilities of the skin are concerned with unhealthy conditions. The dried condition of the skin tends to become older and wrinkled. Nowadays some plant-derived and some animal-

derived contents/ingredients are in use for the preparation of cream for qualitative skin health. About twelve percent of the sebum from the human body is with squalene. The tri-terpene compound, "squalene", the colorless (may also be slightly yellowish) oil compound, for example, is with antiaging properties. The tri-terpene compound, "squalene" was originally obtained from the oil of the liver of a fish shark (Family: Squalidae) [2]. Squalene is the best example of a tri-terpene compound concerning antiaging potential. So, squalene is generally utilized in the skin cream. This squalene is reported for utilization in the production of balm used for the health of the lip, the production of oils tanning, the production of skin creams, and the production of skin moisturizers. According to Mcphee *et al*. [3], olive plants, wheat germ plants, and perennial grass plants (like sugarcane) are a few examples of herbal (or plant) sources for squalene. Dutton [4] reported carmines are used as ingredients of blush (cream or powder used for the cheeks to make them pink and beautiful), nail polish, and lipstick. The carmines are red-colored pigments derived from the body of females of scale insects, *D. coccus* (*L*). The guanine is a shining, crystalline, and shimmery chemical compound derived from fish scales. The products like nail polish, lipstick, eye-shadows, highlighters, and bonzer are obtained from guanine [5]. The antimicrobial properties and wound-healing potentials of honey are well known. The honey is used in the production of balm, production of scrubs, production of lotions, and production of creams [6]. There are some breeds of sheep producing a larger quantity of lanolin. With chemistry reference, the sheep wool gives lanolin. This lanolin deserves waterproofing potential and helps the conservation of water. Protection of the wool and skin of sheep is the function allotted to lanolin by nature. Thus, lanolin is used in the manufacturing of skincare and cosmetic goods. The lanolin compound appears to be a common ingredient in lip balms, glosses, face creams, and moisturizers. Some plants are also rich in lanolin. According to Shanazi *et al.* [7], the herbal sources for lanolin include olive oils, coconut oils, or shea butter. Shellac is an amber-colored resinous product that belongs to the body of the lac insect, *Kerria lacca* (L.). According to Adarkar [8], and Baboo and Goswammi [9], shellac is utilized for the preparation of nail polishes and shiny fluids (lacquers). Glycerine and collagen are the animal-derived natural chemical ingredient used as a moisturizing agent in skin creams. According to Artelt and Schneider [10], animal fat is the source of glycerine. The highest price of collagen is for its significant antiaging properties. Collagen is animal animal-derived protein. It is used in the preparation of creams of beauty. The collagen serves to play a role in the quality improvements in the elasticities of the animal skin. Collagen usage has been shown to reduce the look of wrinkles on the skin. Fish and cattle corpses are the sources of industrial collagen, based on Avila Rodríguez *et al*. [11].

Markets of natural and organic cosmetics are one subset of the industries of beauty and personal care. Formulation of products with natural and organic ingredients is primarily concerned with it. The modern era is used to demand natural, organic, and renewable sources for ingredients of formulations of skin health and beauty. This situation is taking the industrialists towards offering innovative products of nature and sources of renewable categories. Resource of nature needs to be utilized judiciously. This is because natural resources are limited. The closed-system concept for nature-derived ingredients as well as ingredients derived from renewable sources possibly minimizes harmful results (like residue generation, cost of energetic category, transportation, and yield of greenhouse gases [12]. Nowadays, mass rearing of insects appears to be common, which should be utilized for deriving compounds for skin health and other safe cosmetics. According to Van Huis [13], mass rearing of insects deserves efficiency, especially for natural organic compounds. So, it is recognized as a promising as well as eco-friendly alternative.

There is a gradual decrease in the amount of fossil fuel resources due to human activity producing vast amounts of waste and overusing the planet's natural resources. It is, therefore, concerning a safe environment, modern industrial occupations are trying their best to find materials and products in the "Novel" category. The fact about, "plant origin compounds as alternatives for the fossil oil" is leading to overutilization of plant-derived compounds for the application as oleochemicals [14]. In a practical sense, the effects of the use of

plant materials are going to affect the environment significantly. According to Fayle *et al*. [15] and Senior *et al*. [16], the effects of uses of the material may be in the form of deforestation, changes in habitats of flora and fauna, habitat-fragmentation (discontinuities in habitat) and finally, the loss of biodiversity. It means an attempt to extract the compounds through a safe source is the prime concern. There is already a significant impact of human beings on Vasundhara, the earth's planet. This primary impact is through the production of natural food material and functional food materials. It is necessary to alter the manufacturing process to maintain the pace with available (or projected) resources and demand due to population increase. Processing organic waste materials for profitable biomass may lead to a decline in the burden on the ecosystem. The use of insect animals for biodegradations (or eco-friendly degradations) is an excellent avenue for the establishment of the so-called, "Circular-Economy". The term, circularity is also suitable for the concept of "Circular-Economy". This concept deals with a model of the production of resources. This concept is also dealing with the ecofriendly method of consumption in a type of economy. This concept involves sharing, leasing, reusing, refurbishing, repairing, and recycling [17, 18]. The concept of the "Circular-Economy" aims to tackle challenges at the global level (such as changes in climate, loss of biodiversity, increase in plastic-like waste material, and pollution).

The insect BSF (black soldier fly, *Hermetia illucens* L.) is a suitable candidate for human beings on the lines of establishments of feasible and fortified methods of obtaining eco-friendly sources. The methods of breeding of this insect (BSF) have having advantage concerning the stream of reduction of waste materials. With smaller space and economic investments, the breeding of BSF is possible. The five instars of larval stages of the insect, BSF are experts concerning the degradation of all types (organic) waste material [19]. The larval stages of the BSF convert organic waste material into biomaterials (fat, protein, and chitin) with significant quantity and quality [20, 21]. This yield is in the form of biomass. Biomass contains solar energy stored chemicals produced by plants through photosynthetic processes. According to Prashanth and Tharanathan [22], the yields of BSF, in the form of resulting biomaterials (in the form of fat, oil, protein, and chitin) have with potential for application in many areas (like food-and-nutrition industries; biochemical-biotechnical industries; material-science; and pharmaceutical).

The BSF biomass is suitable for use in the production of cosmetic products including creams for the qualitative health of human skin. According to Le Poole [23], the credit of property emollient for making the human skin smooth goes to triglyceride compounds. The triglyceride compounds are experts for not only softening the human skin but also moisturizing the human skin. According to Stamatas *et al*. [24], using the procedure of decreasing the "Trans-epidermal Water Loss (TEWL)", the triglyceride compounds serve a lot for moisturizing the skin. The profiles of fatty acids decide the chemical properties of the fats. Therefore, there are variations in the intensities of working of triglycerides (or other lipid materials) as skin moisturizing or healing. Linoleic acid is one more compound with effective properties of skin protective functions through the cream. Linoleic acid is used for the preparations of skin cream for the qualitative health of skin. The quality of fatty material used in skin cream decides its viscosity. The viscosity of cream depends on specific lipids of fat compounds in their qualities and quantities. The emulsification of lipids depends on the quality and quantity of the specific fats [25]. The oil derived from the mink (carnivore mammalian, belonging to the Mustelidae family) deserves specific and favorable fatty-acid profiles. It is also suitable for the qualitative health of the skin of human beings [26]. On this background of the review of available literature, a present attempt has been planned.

MATERIAL AND METHODS

The steps leading to the completion of the present attempt, the whole work have been divided into BSF-Rearing; Preparation of BSF-Meal; BSF-Cream preparation; Assessment of BSF-Cream; Abilities of cream; Water-number; Skin-renewal and Statistical analysis.

BSF-Rearing

According to da Silva and Hesselberg [27], the egg stage, larval stage; pre-pupal stage; pupal stage, and adult flies are the distinct phases of the life cycle of BSF insects. Due to the longer life duration and feeding style, the BSF larval stage is the significant phase of the life cycle. Pre-pupa is supposed to be the transition phase between the BSF-larval stage and the BSF-pupal stage. For the pupation, larval stages (also called prepupal stages) are used to stop feeding, bury out into the soil (or in the feeding material), and transform inside a hard black casing. The BSF-pupal stages are non-feeding and without motions. There is the emergence of adult BSF-fly from each mature pupa. The adult BSF fly is not feeding. It may prefer to drink water. There is mating of male and female BSF flies. Soon after the mating, male adult BSF-fly die. The adult female BSF-fly is used to lay the eggs. The eggs laid by a single female of BSF are about 500 – 900 (approximately) in number. Soon after laying the eggs, there is the death of the adult female. The fertilized eggs require four to five days for incubation. The climatic conditions are affecting the period of incubation of fertilized eggs. The instars of larval stages are five in number. There is a morphological similarity between the fifth-stage larval form and the form of pre-pupa (except for color and size). The range of size of stages BSF-larval-instars is about 18 mm to 20 mm. The hatched larvae exhibit voracious feeding on different types of organic waste materials (including animal-derived manures, decaying fruits, decaying vegetables, and food waste).

In the present attempt, BSF-rearing was carried out in the insectary (Green House) at "Dr. APIS" (Shree-Krupa Residence, Teachers Society, Malegaon Colony, Tal. Baramati, District – Pune – 413115 India). The Commercial granular poultry feed was used for feeding the stages of larval instars of the insect, black soldier flies (LBSF), *Hermetia illucens* (L.) (Order: Diptera, Family: Stratiomyidae). The pellets of feed of poultry birds were used for feeding BSF larvae. Feed contents were taken in a rearing bin in the form wooden box (LBSF Rearing Bin). The length, breadth, and height of the wooden rearing box measured 2 feet; 1.5 feet, and 1.5 feet respectively. The floor wooden plank was smooth (without holes). The roof plank (top-lid) was with holes (smaller than the size of adults of BSF) for ventilation. Provision of wooden plank (rectangular) was made to place it at the position of the incline (with angles of approximately forty-five degrees with the bottom of the LBSF rearing bin). This provision was to allow the self-harvesting of the instars of the mature larval stage (or pre-pupal stages of BSF). Soon after the conversion of larval instar into prepupa, the BSF is used to migrate the periphery of the rearing bed and is susceptible to self-harvesting through inclined wooden planks. A small quantity of water was sprayed on the content of food material used for BSF-rearing. The spraying of water on the surface of the rearing bed and the surface of food material (commercial poultry feeds) allows the food material to initiate the process of decomposition through bacteria intervention. The fertilized eggs (laid by ten adult BSF females) were procured from ICAR-NIASM. The newly hatched BSF larvae were fed with over ripen slices of fruits of papaya (*Carica papaya* L.). The BSF egg mass was used to keep suspended over fresh food material. A place of coolness with necessary humidity and fresh air flows are the requirements. About twenty-four hours are needed following the supply of ideal circumstances (favorable conditions) for the larval stages to hatch. Slices of ripened papaya fruits (*Carica papaya* L.) were used to separate the young BSF larvae from the incubation tray. The method followed for the feeding stages of larval instars BSF belongs to Khyade [28].

Preparation of BSF-Meal

Concerning feeding, the BSF-larval stages are voracious. The third instars of the BSF-larval stage exhibit a significantly increased rate of food consumption [29]. The process of melanization is responsible for the change in color of the body during the pre-pupal stage (or in the sixth instar of the larval stage). The prepupa (or in the sixth instar of the larval stage) is used to migrate to the periphery of the rearing bed. At this stage (prepupal stage or in the sixth instar of the larval stage) were selected randomly. The individual weight of the prepupa (prepupal stage or in the sixth instar of the larval stage) was noted. For twenty-four hours of duration, they were used to keep in a box of freezer (-35^{o}C). After twenty-four hours of freezing, the pre-pupae were used to process for thawing. Thawing entails several selected pre-pupae, or those in the sixth instar of BSF-larval stages, that have undergone a slight

homogeneity during the thawing process. The current attempt at thawing involved quickly freezing for around 10 minutes at minus eighty-five degrees Celsius. After that, the content was prepared for cold storage, where it was maintained at four degrees Celsius for about 10 minutes; followed by storage at six degrees Celsius for ten minutes; followed by cold storage at eight degrees Celsius for ten minutes, and followed by cold storage at ten degrees Celsius for ten minutes. After that, it was dried in an oven at 60 °C for around 48 hours. The grinding of the BSF-pre-pupal phases was done using a blender. The content so collected was dubbed "BSF-Meal." [30-32].

BSF-Cream preparations

Oven processing was used to dry the Black-Soldier-Fly (BSF-Meal) meal. For 48 hours, the drying process was conducted at 40 °C in the oven. Initially, fifty grams of yellow-refined bee wax were stored for gradual melting at a low temperature. The melted wax was gradually mixed with ten grams of BSF-Meal (in the form of powder). The consistency of the content mixture was aided by constant stirring. For around fifteen minutes, there was constant churning. The homogeneously blended material was cooled. The final product was BSF-Cream [33].

Assessment of physical parameters of BSF-Cream

The methods explained by Muazu *et al*. [34] were utilized for the evaluation of the physical parameters (color of cream, physical state of cream, and smell) of the cream. For this purpose, five panels (each with a hundred individuals) of female volunteer graduates were selected randomly. The cream was applied on all the sides and the surfaces of the left forearm. It was requested of the panel member volunteer graduates to record their own opinions and experiences on the BSF-Cream. Consistency, texture, spreading ability, occluding tendency (consonant caused by blocking the airflow at a given place and its abrupt release), and cream washability are among the characteristics taken into consideration in the endeavor. The findings/observations from the volunteer graduates are in the form of verbal feedback. All the findings/observations were used to record.

Diffusion ability of BSF-Cream

By definition, diffusion of creams (or fluids) is the tendency of penetration (abilities of the cream for penetrations) of the creams (or fluids) into the abutting fluids through the roaming movements of molecules in its content. The diffusion ability of the cream deals with the measurement of its quantities diffused with the skin (body surface). The assessment of the diffusion ability of BSF cream was carried out through the following materials and methods listed by Sabale *et al*. [35]. The standard cream for comparison was also considered for preparation. The ratio of cream base and salicylic acid used for the preparation of standard cream was 98:2. Nutrient agar medium was also considered for preparation. The beef extractives (measuring ten grams); peptone, the aqueous protein hydrolysate (measuring ten grams); common salt, the sodium chloride (measuring five grams); agar (a jelly substance derived from algae) (measuring 1.2 grams) and distilled water (measuring 1000 ml) were considered for the preparation of nutrient-agar medium. The addition of these components was made in a petri dish. The small and short hole was created at the center of nutrient-agar-medium. Next, the cream was put into the "Nutrient-Agar" medium's center hole in a Petri dish. The pink circles surrounding the cream application site showed how BSF-Cream had diffused over time. Time was measured to see how many pink rings might emerge at the cream application site—the greatest number feasible.

Water number for BSF-Cream

As per Pattanayak *et al*. [36], the water number of cream or ointment is determined by determining the greatest quantity (or volume) of water necessary for additions to 100 grams of cream base at a certain temperature. To continuously stir the base, BSF cream was utilized. For additions, the predetermined volume of distilled water was used. Soon after the appearance droplets of water remained in a container was considered an indication of water that was no more required for absorption by the base. The endpoint considered was the time (minutes: seconds) of occurrence of droplets of water initiated for appearing in the container.

Microbial counts

The counting of microbiological counts was done using the pour-plate method [34]. Single-gram

dilutions of BSF-Cream were made in one-in-a-thousand serials. It was inoculated using the pour-plate technique. For the aspirations into the nutritional agar media, one milliliter of diluted material was used. At a temperature of forty degrees Celsius (40 °C), the "nutrient agar media" was aseptically put into the sterile petri dish. Then, swirling was done with the material. After a twenty-four-hour incubation period at 37 degrees Celsius (37 °C), the resulting preparation was allowed to solidify. The counting of typical colonies of the microbiological growth on plates was done after the incubation period. "Colony forming unit" per gram (cfu/g) was the unit used to display the results of Muazu *et al*. [34].

The ability of BSF-Cream for skin renewal

The method of Jansen *et al*. [37] was utilized for the evaluation of BSF-Cream for the renewal of skin (through turnovers of the stratum corneum layer of skin). Due to the dye's sensitivity to light, five percent (w/w) of Dansyl chloride was made using white petrolatum under dim red light in the dark. Human-cadaver skin was utilized for assessment of the renewal of skin through topical application of the BSF cream. Fresh pieces of skin from the forearm were procured for the preparation of "Human-Cadaver-Skin" from Baramati Medical College. They were taken to the experimental site right away and placed on ice. Keeping the fresh skin pieces in ice serves to avoid deterioration. The subcutaneous fatty material attached to the skin was removed and the skin pieces were cleaned. Trypsinization is a laboratory procedure for cell dissociation through the use of the enzyme trypsin (protein-digesting enzyme). Trypsinization allows the separation of the epidermis from the dermis. The warm-trypsinization method [38] was utilized in the present attempt. We plunged the skin piece into warm water. Slow peelings were used to divide the skin into layers. For approximately five minutes, the peeled epidermis layers were submerged in an aqueous solution containing five percent trypsin, a proteolytic enzyme. Stratum corneum is separated using trypsinization. To spread them out over wire mesh (stainless steel), the preparations were treated. The mixture was left in a desiccator for the whole night to dry. Subsequently, the stratum-corneum layer preparations were processed and divided into three pieces, each with a dimension of 1 cm × 1 cm. Three pieces of layers of stratum-corneum were utilized for storage. A suitable desiccator was used for the storage of pieces of layers of stratum-corneum.

The "Dansyl chloride" stain was used to smear on each preparation of the skin patch (stratum-corneum with smear). The index finger was used for smearing. The stained pieces of skin were processed to sandwich among glass slides. The sandwiches were refrigerated for twenty-four hours at a temperature lower than zero. To determine the "staining intensity," the skin segments that were stained were utilized. It was utilized with a spectrofluorometer set at 340 nm. The observations on the decline in the intensity of dansyl-chloride stain were continued for sixty days. Daily observations were recorded.

The first two skin pieces were considered as untreated control. The next two skin pieces were treated with BSF cream. Two skin pieces were treated with known antiaging skin creams. (retinol cream was used as the standard anti-aging skin cream). Retinol is vitamin-A the derivative. The retinol is converted into retinoic acid soon after the diffusion among skin layers. This retinoic acid thus formed is responsible for the enhancement of the collagen rate of production. The duration (days) required for completion of the disappearance of the stained patches was considered as a unit measurement of renewal time for stratum corneum.

Statistical analysis

Each attempt was made three times. Consistency in outcomes is made possible by repetition. A statistical analysis of the gathered data was performed [39, 40].

RESULTS AND DISCUSSION

Tables 1 and 2 and **Figures 1 and 2** are concerned with results pertaining present attempt at the analysis of BSF-Cream for antiaging influence. The skin cream obtained from the prepupal instars of the larval stages of the Black Soldier Fly (BSF) insect in the current study had a smooth texture. Regarding color, smell, and after-feel, BSF-Cream was light brown, pleasant, and greasy, in that order. The human body may experience the sensation of skin cream thanks to its sensitivity to touch. The human body's touch sense is its most important component. Diffusion abilities are simply the

tendency of skin creams or fluids used for skin health to penetrate (or have the ability to penetrate) adjacent fluids through the voyaging motions of the molecules therein. Diffusion ability quantifies the amount of skin cream that has diffused from the skin's surface. The length (unit: centimeter) of journey of the skin-cream diffused from skin surface at the time interval of 5 minutes, 10 minutes, 15 minutes, 20 minutes, 25 minutes, 30 minutes after the application of the skin-cream was found reported 00.722 (±0.057); 00.893 (±0.065); 01.368 (±0.059); 01.955 (±0.786); 02.898 (±0.843); 03.848 (±0.964) respectively. The present attempt is reporting a significant rate of diffusion for BSF-Cream in human skin.

Table 1. The decline in intensity of stained patches with applications of the BSF-cream.

Day	Untreated Control Group.	BSF-Cream Treated Group.	Standard (Known) Cream Treated Group.
05	99.252 (±8.679)	82.684 (±7.716)	74.724 (±7.654)
10	97.376 (±8.329)	67.191 (±6.495)	43.364 (±9.517)
15	87.571 (±8.073)	41.096 (±8.648)	19.264 (±5.786)
20	64.741 (±6.469)	15.789 (±3.774)	12.189 (±4.693)
25	42.582 (±7.786)	03.456 (±0.786)	00.741 (±0.054)
30	39.712 (±7.684)	-	-
35	32.769 (±7.769)	-	-
40	30.263 (±6.485)	-	-
45	26.738 (±6.467)	-	-
50	19.536 (±5.758)	-	-
55	12.513 (±3.936)	-	-
60	10.418 (±1.786)	-	-

- Each figure is the mean of the three replications.
-Figure with ± sign in the bracket is the standard deviation.
-Figure below the standard deviation is the increase for calculated parameter and percent increase for the others over the control. *: P < 0.05; **: P < 0.005; ***: P < 0.01

Table 2. The diffusion ability of BSF-Cream.

Serial No.	Duration (minutes)	Diffusion Unit	Water Number
1	05	00.722 (±0.057)	01
2	10	00.893 (±0.065)	02
3	15	01.368 (±0.059)	03
4	20	01.955 (±0.786)	04
5	25	02.898 (±0.843)	05
6	30	03.844 (±0.964)	06

- Each figure is the mean of the three replications.
-Figure with ± sign in the bracket is the standard deviation.
-Figure below the standard deviation is the increase for calculated parameter and percent increase for the others over the control. *: P < 0.05; **: P < 0.005; ***: P < 0.01

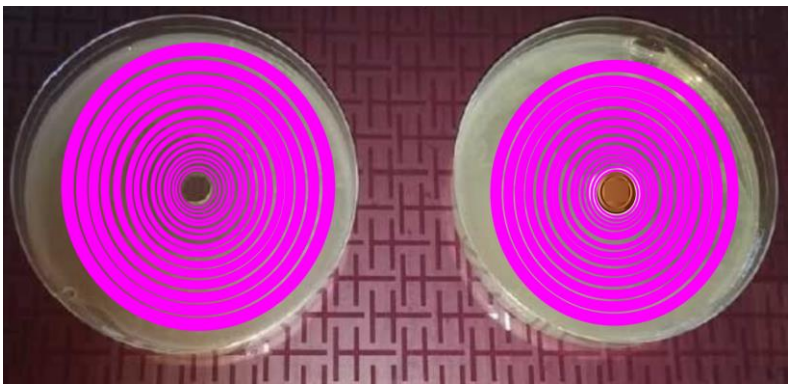

Figure 1. Diffusion of the “Black Soldier Fly Meal (BSFM) Cream” through nutrient agar medium.

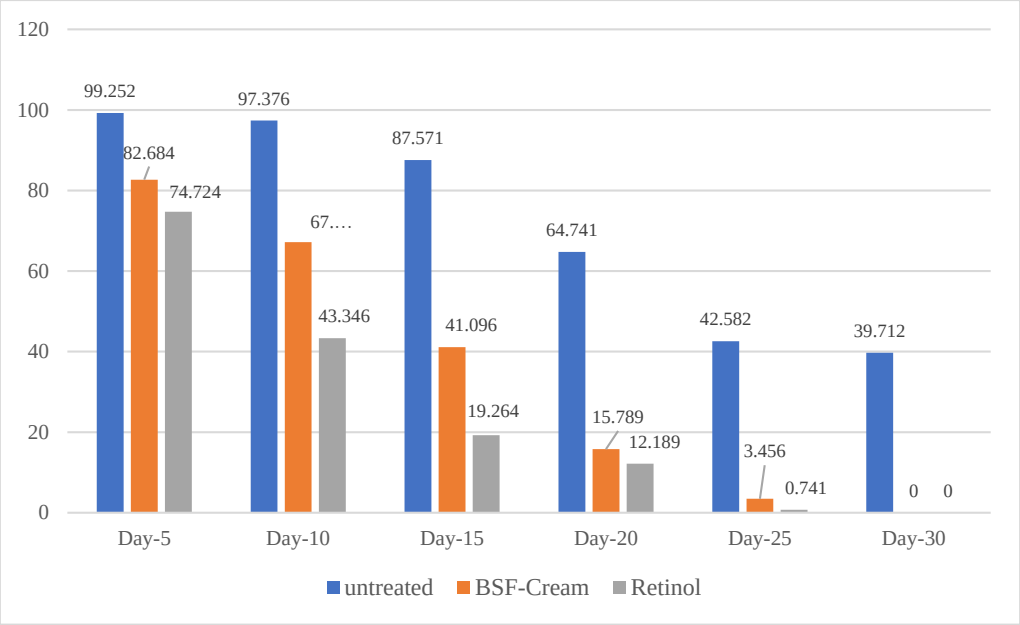

Figure 2. Percentage of Intensity to Decline in fluorescence of the "Dansyl-chloride" (5-Dimethyl-Amino-Naphthalene-1-Sulfonyl-chloride) stained patches with the application of the cream prepared through the use of the Black Soldier Fly Meal (BSFM) for the Activity of the Skin Renewal.

The percent decline in the intensity of fluorescence for the control group, the BSF-Cream treated group, and the group treated with retinol cream on the fifth day after the application were 99.252 (±8.679), 82.684 (±7.716) and 74.724 (±7.654) respectively. The percent decline in the intensity of fluorescence for the control group, the BSF-Cream treated group, and the group treated with retinol cream on the tenth day after the application were 97.376 (±8.329), 67.191 (±6.495) and 43.364 (±9.517) respectively. The percent decline in the intensity of fluorescence for the control group, the BSF-Cream treated group, and the group treated with retinol cream on the fifteenth day after the application were 87.571 (±8.073), 41.096 (±8.648), and 19.264 (±5.786), respectively. The percent decline in the intensity of fluorescence for the control group, the BSF-Cream treated group, and the group treated with retinol cream on the twentieth day after the application were 64.741 (±6.469), 15.789 (±3.774), and 12.189 (±4.693), respectively. The percent decline in the intensity of fluorescence for the control group, the BSF-Cream treated group, and the group treated with retinol cream on the twenty-fifth day after the application were 42.582 (±7.786), 03.456 (±0.786), and 00.741 (±0.054), respectively. The percent decline in the intensity of fluorescence for the control group, the BSF-Cream treated group, and the group treated with retinol cream on the thirtieth day after the application were 39.712 (±7.684), 00.000, and 00.000, respectively. The percent decline in the intensity of fluorescence for the control group, the BSF-Cream treated group, and the group treated with retinol cream on the thirty-fifth day after the application were 32.769 (±7.769), 00.000, and 00.000, respectively. The percent decline in the intensity of fluorescence for the control group, the BSF-Cream treated group, and the group treated with retinol cream on the fortieth day after the application were 30.263 (±6.485), 00.000, and 00.000, respectively. The percent decline in the intensity of fluorescence for the control group, the BSF-Cream treated group, and the group treated with retinol cream on the forty-fifth day after the application were 26.738 (±6.467), 00.000, and 00.000, respectively. The percent decline in the intensity of fluorescence for the control group, the BSF-Cream treated group, and the group treated with retinol cream on the fiftieth day after the application were 19.536 (±5.758), 00.000, and 00.000, respectively. The percent decline in the intensity of fluorescence for the control group, the BSF-Cream treated group, and the group treated with retinol cream on the fifty-fifth day after application was 12.513 (±3.936), 00.000, and 00.000, respectively. The percent decline in the intensity of fluorescence for the control group, the BSF-Cream treated group, and

the group treated with retinol cream on the sixtieth day after the application were 10.418 (±1.786), 00.000, and 00.000, respectively. The statistical analysis through the use of "t-test", results reveals significant influence ($P<0.05$).

In comparison with the control, the BSF-Cream treatment found a significant reduction in the time of skin renewal. The current attempt at daily treatments has shown the predicted increase in length for skin renewal through treatments with chemical agents like hypo-mitotic chemical compounds and a decrease with hyper-mitotic agents. Furthermore, this remained after staining and was said to have started two weeks prior. According to Ridge *et al*. [41], it is not attainable when treatments start after staining. Before labeling with the stain (dansyl chloride), it is crucial to pre-treat the skin with BSF-Cream for the establishments to show changes in mitotic division activities for cell renewal. This is because the skin needs to be in full equilibrium in the altered or affected state of mitotic division. Only comparisons with treatment sites should be able to validate successive statements on the impact on cell renewal resulting from applying the skin cream's ingredients [41]. The duration of the skin layer of the stratum corneum in both young adults and adults is around twenty days. In the case of elderly adults, the transit time of the stratum corneum skin layer is extended by almost 10 days. The number of horny layers in the skin organ remains constant as one age. The outcomes of the current research effort seem to represent decreased proliferation of epidermal cells, as evidenced by the increase in transit time length for the stratum-corneum. Throughout the adult period of life, there is a steady rate of epidermal cell renewal without any reduction. During the early stages of life, the "decline renewal of the epidermal cells" remains essentially unchanged. Grove and Kligman (1983) report that around the age of fifty, there is a considerable fall in the "decline renewal of the epidermal cells [42]." A fruitful claim regarding BSF-Cream's effect on cell renewal should only be made if the outcomes are compared to the treatment site using a regular (or well-known) antiaging skin cream. Both (BSF-Cream and standard-cream) should be allowed to equilibrate. The present research work is reporting a significant antiaging influence on human skin.

CONCLUSION

BSF-Cream deserves significant antiaging efficiencies. This cream will unquestionably prove to be a superior BSF product for antiaging treatment. BSF-Cream can be used to stop the signs of aging. The aging process is natural and unavoidable. The healthy BSF cream for the skin slows down the natural aging process. Further attempts of studies may help to finalize the age of application of BSF-Cream by qualitative skin health.

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