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Utilization of BSF-Cream for Antiaging Impact on Human Skin

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ABSTRACT

The most significant and revolutionary influencing field of aging treatment is dermatology branch of health science. The endogenous factors as well as exogenous factors are responsible for aging process. The gene-mutations, cell-metabolism and hormonal balance are the endogenous factors associated with aging-process. The ultraviolet radiations, pollution causing chemical-compounds and toxic-compounds are the exogenous factors associated with aging-process. Decline the efficiencies of the body and metabolic activities soon after reaching the stage of maturity are associated with the phase of ageing. The antiaging potentials of BSF-cream has been assessed in present research work. The method of dansyl-chloride-fluorescence has been utilized for evaluation of the BSF-cream for the renewals of the histological layers of skin. The present attempt is recording sixty days for disappearance of stained patches of control group. The percent decline in the intensity of fluorescence for control group, BSF-Cream treated group and group treated with retinol cream on the twenty-fifth day after application was 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 exert 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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INTRODUCTION

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

in use for the preparation of cream for the qualitative skin health. About twelve percent of the sebum from the human body is with squalene. The tri-terpene compound, "squalene", the colourless (may also slightly yellowish) oil-compound, for example is with antiaging properties. The tri-terpene compound, "squalene" was originally obtained from oil of liver of fish shark (Family: Squalidae) [2]. Squalene is the best example of tri-terpene compound with reference to antiaging potential. So, squalene is generally utilized in the skin cream. This squalene is reported for utilization in the production of balm used for health of lip, the production of oils of tanning, the production of skin-creams and the production of skin-moisturisers. According to Mcphee *et al*. (2014), olive plants, wheat germ plants and perennial grass plants (like sugarcane) are few examples of herbal (or plant) source for squalene [3]. Dutton (2021) reported carmines use as ingredients of blush (cream or powder used for the cheeks to make them pink and beautiful), nail-polish and lip-sticks [4]. The carmines are red coloured pigments derived from the body of females of scale insects, *D. coccus* (*L*). The guanine is shining, crystalline and shimmery chemical compound derived from fish-scales. The products like nail-polish, lip-stick, eye-shadows, highlighters and bonzer are obtained from guanine [5]. 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 larger quantity of lanolin. With reference to chemistry, the sheep wool gives lanolin. This lanolin deserves water proofing potential and helps the for conservation of water. Protection of wool and skin of sheep is the function allotted to lanolin by the nature. Thus, lanolin is used in the manufacturing of skin care and cosmetic goods. The lanolin compound appears to be common ingredients of the lip-balms, glosses and face-cream and moisturiser. Some plants are also rich in lanolin. According to Shanazi *et al.* (2015), the herbal sources for lanolin includes: Olive-oils, coconut-oils or shea-butter [7]. Shellac is amber coloured resinous product belongs to the body of lac insect, *Kerria lacca* (L). According to Adarkar (1945), Baboo and Goswammi (2010), shellac is utilized for the preparation of nail-polishes and the shiny fluids (lacquers) [8, 9]. The glycerine and collagen are the animal-derived natural chemical ingredient used as moisturizing agent of skin creams. According to Artelt and Schneider (2002), the animal fat is source to obtain glycerine [10]. The highest price of the collagen is for its significant antiaging property. The collagen is animal derived protein. It is used in preparations of creams of beauty. The collagen serves to play 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*. (2018) [11].

Markets of natural and organic cosmetics is 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 using to demand the 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 source of renewable categories. Resource of the 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 is possibly minimize harmful results (like: residue generation, cost of energetic category, transportations and yield of greenhouse gases [12]. Now a days, mass rearing of insects appears to be common, which should be utilized for deriving compounds of skin health and other safe cosmetics. According to Van Huis (2012), mass rearing of insects deserve efficiency, especially for natural organic compounds [13]. So, it is recognized as promising as well as eco-friendly alternatives.

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, with reference to safe environment, modern industrial occupations are trying their best to find materials and products of "Novel" category. The fact about, "plant origin compounds as alternatives for the fossil-oil" is leading for over utilization of plant derived compounds for the application as oleochemicals [14]. In practical

sense, the effects of uses of plant-material are going to affect environment significantly. According to Fayle *et al*. (2010) and Senior *et al*. (2013), the effects of uses of plant-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 [15, 16]. It means, attempt on extractions of the compounds through safe source is prime concern. There is already significant impact of human being on Vasundhara, the earth planet. This primary impact is through production of natural food material and functional-food-material. It is necessary to alter the manufacturing process in order to maintain the pace with available (or projected) resources and demand due to population increase. Through processing organic waste materials for profitable biomass may lead to decline the burden on ecosystem. Use of insect animals for biodegradations (or ecofriendly degradations) is an excellent avenue for the establishments of so called, "Circular-Economy". The term, circularity is also suitable for the concept of "Circular-Economy". This concept is dealing as a model of productions of resources. This concept is also dealing as the ecofriendly method of consumptions in a type of economy. This concept involves share, lease, reuse, refurbishing, repair and recycle [17, 18]. The concept of the "Circular-Economy" is aiming to tackle challenges of 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 suitable candidate for human being on the lines of establishments of feasible and fortified methods of obtaining ecofriendly sources. The methods of breeding of this insect (BSF) are having advantage with reference to 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 with reference to degradation all the types (organic) waste material [19]. The larval stages of the BSF converts 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 chemical from produced by plant through photosynthetic process. According to Prashanth and Tharanathan (2007), the yields of BSF, in the form of resulting biomaterials (in the form of fat, oil, protein and chitin) are with potentials of application in many areas (like food-and-nutrition industries; biochemical-biotechnical industries; material-science; and pharmaceutical) [22].

The BSF biomass are suitable to use in productions of cosmetic-products including creams for qualitative health of human skin. According to Le Poole (1994), the credit of property pertaining emollient for making the human skin smooth goes to triglyceride compounds [23]. The triglyceride compounds are experts for not only softening the human skin but also for moisturising the human skin. According to Stamatas *et al*. (2008), by means of the procedure of decreasing the "Trans-epidermal Water Loss (TEWL)", the triglyceride compounds are serving a lot for moisturising the skin [24]. The profiles of fatty-acids decide the chemical properties of the fats. Therefore, there is 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. The 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 decide its viscosity. Viscosity is of cream depends on specific lipid of fat compounds in their qualities and quantities. The emulsification of lipids depends of the quality and quantity of the specific fats [25]. The oil derived from the mink (carnivore mammalian, belong to the Mustelidae family) deserves specific and favourable fatty-acid-profiles. It is also suitable for qualitative health of skin of human beings [26]. On this much background of review of available literature, present attempt has been planned.

MATERIAL AND METHODS

The steps leading to the completion of present attempt, whole work has 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 (2020), the egg-stage, larval-stages [27]; pre-pupal-stage; pupal-stage and adult flies are the distinct phases of life cycle of BSF insects. Due to the longer life duration and feeding style, the BSF larval stage is the significant phase of life cycle. Pre-pupa is supposed to be transition phase in between BSF-larval stage and BSF-pupal stage. For the pupation, larval stages (also called prepupal stages) use 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 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 use 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 death of adult female. The fertilized eggs require four to five days for incubation. The climatic conditions are affecting on the period incubation of fertilized eggs. The instars of larval stages are five in number. There is morphological similarity among the fifth stage larval form and form of pre-pupa (except colour 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 type of organic waste materials (including animal derived manures, decaying-fruits, decaying-vegetables, and food-wastes).

In the present attempt, BSF-rearing was carried 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 fly (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 at position of incline (with the angles of approximately forty-five degrees with the bottom of LBSF rearing bin). This provision was to allow the self-harvesting of the instars of mature larval stage (or pre-pupal stages of BSF). Soon after conversion of larval instar into prepupa, the BSF use to migrate periphery of rearing bed and are susceptible for self-harvesting through inclined wooden plank. Small quantity of water was sprayed on the content of food material used for BSF-rearing. Spraying of water on the surface of rearing bed and on the surface of food material (commercial poultry feeds) allow 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. The 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 (favourable conditions) for the larval stages to hatch. Slices of ripen of papaya fruits (*Carica papaya* L.) were used to separate the young BSF-larvae from incubation tray. The method followed for feeding stages larval instars BSF belongs to Khyade (2021) [28].

Preparation of BSF-Meal

With reference to feeding, the BSF-larval stages are voracious. Third instars of BSF-larval stage are exhibiting significantly increased rate of food consumption [29]. The process of melanization is responsible for change in colour of the body of pre-pupal stage (or in the sixth instar of larval stage). The prepupa (or in the sixth instar of larval stage) use to migrate to the periphery of rearing bed. At this stage (prepupal stage or in the sixth instar of larval stage) were selected randomly. Individual weight of the prepupa (prepupal stage or in the sixth instar of larval stage) was noted. For the duration of twenty-four hours of duration, they were used to keep in box of freezer (-35^{o}C). After twenty-four hours of freezing, the pre-pupae were used to process for thawing. Thawing entails a number of 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*. (2015) was utilized for evaluation of the physical parameters (colour of cream, physical state of cream, and smell) of the cream [34]. For this purpose, five panels (each with hundred individuals) of female volunteer graduates were selected randomly. Cream was applied on all the sides, on 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 finding / observation from the volunteer graduates 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 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 is dealing with measurement of its quantities diffused with the skin (body surface). The assessment of diffusion ability of BSF-cream was carried through following materials and methods listed by Sabale *et al*. (2011) [35]. The standard cream for comparison was also considered for preparation. The ratio of cream base and salicylic acid used for 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 (jelly substance derived from algae) (measuring 1.2 grams) and distilled water (measuring 1000 ml) were considered for the preparation of nutrient-agar medium. Addition of these components were made in petri-dish. Small and short hole was created at the centre of nutrient-agar-medium. Next, 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*. (2011), the water-number of cream or ointment is determined by determining the greatest quantity (or volume) of water necessary for additions into 100 grams of cream base at a certain temperature [36]. 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 as the indication of water that no more required for absorption by the base. The end point 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 oC), 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 oC), the resulting preparation was allowed to solidify. The counting of typical colonies of the microbiological growth on plates was done at the conclusion of the incubation period. "Colony forming unit" per gram (cfu/g) was the unit used to display the results Muazu *et al*. (2015) [34].

Ability of BSF-Cream for skin renewal

The method of Jansen *et al*. (1974) was utilized for evaluation of BSF-Cream for renewal of skin (through turnovers of stratum-corneum layer of skin) [37]. 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 renewal of skin through topical application of the BSF-Cream. Fresh pieces of skin of 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 serve to avoid deteriorations. The subcutaneous fatty material attached to the skin was removed and the skin pieces were cleaned. Trypsinization is laboratory procedure pertaining cell dissociation through the use of enzyme-trypsin (protein digesting enzyme). Trypsinization allow separation of epidermis from dermis. The warm-trypsinization-method [38] was utilized in 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. In order 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. Suitable desiccator was used for storage of pieces of layers of stratum-corneum.

The "Dansyl chloride" stain was used to smear on each preparation of 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 spectroflurometer set at 340 nm. The observations on decline in the intensity of dancyl-chloride stain were continued for sixty days. Daily observations were recorded.

The first two skin-pieces were considered as untreated control. Next two skin-pieces were treated with BSF-Cream. Two skin-pieces were treated with known antiaging skin-cream. (retinol cream was used as the standard anti-ageing-skin-cream). The 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 enhancement of the collagen rate of production. The duration (days) required for completion of disappearance of the stained patches was considered as 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

The **Tables 1 and 2** and **Figures 1 and 2** are concerned with results pertaining present attempt on 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. Present attempt is reporting significant rate of diffusion for BSF-Cream in human skin.

Table 1. 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 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 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

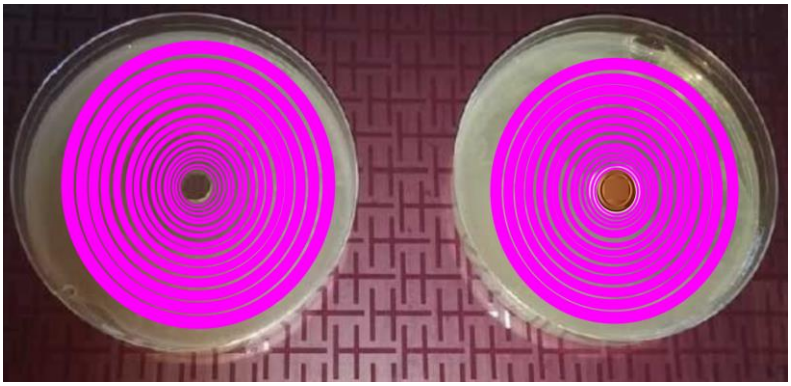

Figure 1. Diffusion of the “Black Soldier Fly Meal (BSFM) Cream” through nutrient agar medium.

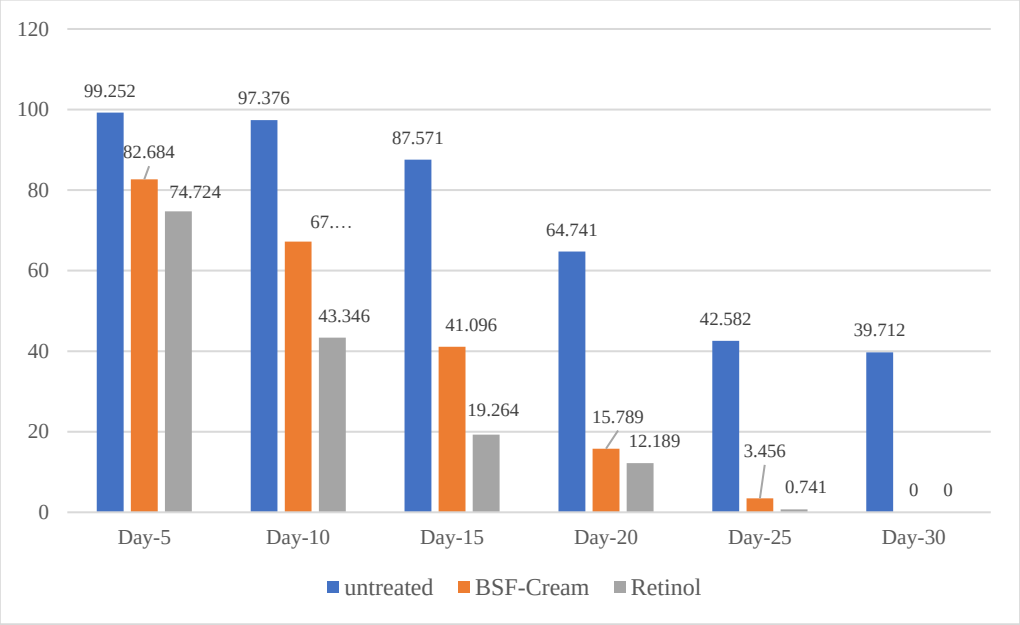

Figure 2. Percentage of Intensity to Decline in fluorescence of the "Dansyl-chloride" (5-Dimethyl-Amino-Naphthalene-1-Sulfonyl-chloride) stained patches with the application of the cream prepared through the use of the Black Soldier Fly Meal (BSFM) for the Activity of the Skin Renewal.

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

10.418 (±1.786), 00.000 and 00.000 respectively. The statistical analysis through the use of "t-test", the results reveal significant influence ($P<0.05$). In comparison with the control, the BSF-Cream treatment was found significant reduction in 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*. (1988), it is not attainable when treatments started after staining [41]. Prior to labeling with the stain (dansyl chloride), it is crucial to pre-treat the skin with BSF-Cream for the establishments in order 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 ages. The outcomes of the current research effort seem to represent decreased proliferations 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 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 skin slow 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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