



COMPARATIVE ANALYSIS OF THERAPEUTIC BODY CREAM FORMULATED FROM NATURAL INGREDIENTS AND COMMERCIAL SAMPLE

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ABSTRACT

Therapeutic body creams absorb quickly to restore vitality and softness to even the driest skin. A true concentrated thick cream at relatively cool temperatures becomes smoother as it warms to skin, leaving skin soft with a smooth powdery after-touch. The study was an observational experimental design that investigated the effectiveness of therapeutic properties of the liquid extract of the tea leaf for chemical comparison with the common synthetic therapeutic cosmetics. The therapeutic body cream obtained from Tealeaf (*Cymbopogon citratus*) was analyzed using both *in vitro* (classical and instrumental) and *in vivo* techniques. The values obtained from the analysis of the sample were; moisture content (88.77%), vitamin E (357.23, 347.15), vitamin A (216.48, 216.49), free fatty acid (13.39, 13.5), pH (6.85, 6.80) and physical stability. These results were used for the formulation of the therapeutic body cream which was chemically compared with commercial synthetic therapeutic body cream such as (silver lime body, epidermis, *Viodurula* body creams). The result showed that the cream can be alternatively used for the prevention and reduction of body inflammation and skin cancers. It could therefore, be inferred that the locally produced formulated body cream can be used as an alternative therapeutic body cream which may reduce the cost of importation and procurement of synthetic creams, and invariably reduced morbidity and mortality rate associated.

Key Words: Free Fatty Acid, Inflammatory, In vitro, In vivo, Therapeutic, Vitamins,

1.0 INTRODUCTION

Like lotion, body cream is used to treat and prevent dry, cracked skin while keeping it supple and moisturized. Because it provides a barrier that provides ultra-hydration, it's best for dry to excessively dry skin and for normal skin during the harsher winter months. While therapeutic body creams absorb quickly to restore vitality and softness to even the driest skin. A true concentrated thick cream at relatively cool temperatures becomes smoother as it warms to skin, leaving skin soft with a smooth powdery after-touch, (Fulton, 2000). The reviewed researches show that it is of high instructional medicinal importance the use of herb based body creams, this could be buttressed by the years of experience of some of the reviewed researcher's reports, who worked as a community pharmacist in complementary medicine and for the years in the manufacture of the pinadari Herb farms, and skin care range (Bezakova, et al., 2009).

A cream can be successfully used to deliver and hold nutrient and medication on the skin surface. Both the oil and aqueous component can be used as a carrier. The skin has a limited capacity to absorb many oil and some chemical compound and is responsive to surface medication such as herbal extract and to vibratory energies such as flower essences. Creams are protected to give fragrance and freshness to skin and promote health and lovely appearance. Some are manufactured to treat pimples, some to maintain the tone or complexion of the skin. Ongoing positive feedback from client using the various body cream clearly identify the need for therapeutic body cream of high natural quality origin. Making natural skin care product as an indication that there is a place in today's market for creams produced using the procedure and ingredients of natural origin (Nikolas et al. 2001).

The skin ageing for a number of reasons naturally, age with increasing loss of flexibility and ageing as collagen and elastin within the epidermis slowly cross-links and become less elastic, to a degree this is part

of the genetic inheritance present within all animals, since ageing was not observed at the same rate, nor share identical lifestyles (Bhalla, et al., 2001). It has been extensively proven that sunlight hastens the degradation of the skin by the bombardment of tissue with high energy photon present in UV-A and UV – B wavelength of sunlight (Brand – Garaus, et al., 2001).

This high energy has sufficient power to cleave molecules into free radical, which are then available to react, chemistry and other external factors such as the free radicals produced in vehicle exhaust gases, dirty industrial processes and smoking can further speed up the detriment effect on healthy skin (Dweek, 2006).

Body creams generally consists of two basic components, an oil phase and an aqueous phase. A body cream is formed when the oil phase is successfully emulsified into the aqueous phase producing oil in water emulsion of stable and solid consistency at room temperature. The acceptance of these products (sample) can in part be attributed to the use of extra virgin and where possible organic oils, these recently prepared herbal extract from organically growth fresh herbs and the use of adequate and low irritant antioxidant preservatives and emulsified, and carefully combined to produce a stable, cosmetically very acceptable, therapeutic cream. In the formulation for this research work, the emulsifier, preservative and glycerin used were made by the chemical manipulation of the plant derived ingredients.

Plant oil produced from seeds and fruit kernels are rich source of fatty acid which provide emolliency, hydrophobicity and skin protection from the drying effect of wind and sun. In addition to these were gamma-linolenic acids (GLA), Linolenic acids and other complex molecules. The white lily extracted contain in the formulation will further ensure that all mirror skin compliant and problems are sorted out, therefore the therapeutic treatment lotion should not be seen merely as a moisturizing cream, because the formulation was radically different from any other body cream that someone might have come across in life. “(ByFord, et al., 2002).

This work aimed at formulated therapeutic body cream of less carcinogenic effect and high moisturizing power from natural products. Since, minor skin problem is being aggravated with the use of conventional body cream, this needing immediate research attention in sorting out ethical treatment.

2.0 MATERIALS AND METHODOLOGY

2.1 Materials

2.1.1 Raw Materials

The following raw materials were used:

- **Paraffin oil:** This is a waste petroleum product. It is the binding agent in this formulation.
- **Petroleum Jelly:** It is also a waste petroleum product; described as semi liquid or solid, it is the base of this product.
- **Lanolin:** It's functions was to keep the body soft.
- **Colourant:** this refers to the visual and aesthetic attribution on the product. The application which must be regulated, because excessive use of colourant may render the product unattractive.
- **Water:** The primary ingredient in cream, it is typically making up about 250ml of the entire formulation, distilled water, which was specially treated to remove various particles and ions in the cream.
- **Citric acid:** It was added as a preservative.
- **Fragrance:** One of the primary ingredients that influence the purchase of a cream is its colour, appearance and odour. (Christic, et al., (2009).

2.1.2 Sampling Method

The plant, *cymbopogon ciatrus* were collected from Talafia area, Ede, in Ede North Local Government Area of Osun State, by basket survey. Epiderm, viodurula, silver lime body lotion was obtained from Oja-oje market, in Ede, Osun state.

2.1.3 Sample Treatment

The plant was cut into pieces and air dried under shade, to avoid direct contact with UV-radiation from the sun in other to reduce photosynthesis, and blended into powder using electric blender.

2.1.4 Apparatus

The following apparatus were used; soxhlet extractor, distillation apparatus, thermometer, measuring cylinder, blender, analytical balance, two stainless pot, heating system, stirrer, Volumetric flask, Beaker, Aluminum foil, and Spectrophotometer.

2.1.5 Reagents

The chemical reagents used were; Citric acid, Glycerin, Propylene glycol, Croda wax, T.E.A, Fragrance, Chloroform, Sulphuric acid, Potassium hydroxide, Alcohol, indicator (phenophitalien).

2.2 Methodology

2.2.1 Study Design

The study was an observational experimental design, basically invitro technique.

2.2.2 Production Processes

➤ Extraction Technique

The dried leaf was pulverized with blender to breakdown the cells and packed into a soxhlet extractor. It was then extracted with ethanol by dissolving 50g of the tea leaf into 200ml of ethanol, and the extract distilled using distillation apparatus, after which the extract was separated from ethanol under reduced pressure.

➤ Preparation Steps

Step i: The Cream was made by measuring 100ml of paraffin oil, 50ml of propylene glycol, 50ml of T.E.A, 50ml of glycerine and 50g of croda wax, 50g of petroleum jelly, and 22g of lanolin into a large stainless pot.

Step ii: The aqueous component such as 250ml of sterile water, and 50ml of the tea leaf extracts were measured into smaller stainless pot.

Step iii: The oil component containing the emulsifier, (paraffin oil) propylene glycol, Glycerine, T.E.A, Petroleum jelly, crodal wax was heated for 10min at 70⁰C with constant stirring for proper mixing of the component and also the aqueous component was heated at 80⁰C.

Step iv: The mixture of aqueous and oil component was allowed to reach the required temperature; the aqueous component was removed carefully from the flame. Then the oil component was also removed, poured into aqueous component and stirred vigorously using wooden stirrer, the mixture was stirred for 30mins to allow the emulsion to form, the remaining ingredient including citric acid (preservative) and fragrance oil, colourant was added at this point with constant stirring until all the ingredient are well mixed or blended together.

Step v: The liquid emulsion was allowed to flocculate for 5mins and the base of the stainless pot was tapped to removed air bubbles and allowed to cool (showing the sign of thickening) poured into the container before the emulsion is set and uncapped. Pouring was done under aseptic condition, when the setting of the cream was observed the container was capped and labeled.

Below were the standardized formulae with 620g natural therapeutic cream obtained from plant derived extract (antioxidant) and preservative (citric acid). The mixture was partitioned using 95g ten different container, shown in the table below.

Table 1: Formulation of Oil Component

Oils	Quantity (620g)	%	% total
Paraffin oil	100ml	10	37.2
Croda wax	50g	5	
Petroleum jelly	50g	5	
Propylene glycol	50ml	5	
Lanoline	22g	2.2	
Glycerine	50ml	5	
T.E.A	50ml	5	
Grand Total		37.2	37.2

Table 2: Formulation of aqueous component

Aqueous component	Quantity	%	% Total
Sterile water	250ml	25	31
Tea leave extract	50ml	5	
Citric acid	10ml	1	
Fragrance(Lavender oil)	10ml	1	1
Grand Total		69.2	69.2

2.2.3 Analysis

The following tests were carried out; Physical Stability, PH, Viscosity Profile, Toxicity, Vitamin E (Tocophenol), Vitamin A, Dry Mater, Moisture Content, and Free Fatty Acid.

3.0 RESULTS AND DISCUSSION

3.1 Results

3.1.1 Suitability Test on the Lotion Creams

Table 3: Suitability of the products

Sample	PH	%Free Fatty Acid	Colour Change	Odour Change	Body Irritation	Vitamin E (mg/100g)	Vitamin A (mg/100g)
Lotioncream 1	6.85	13.39	Nil	Nil	Nil	357.23	216.48
Lotion cream 2	6.85	13.9	Nil	Nil	Nil	357.23	216.48

3.1.2 Suitability Test on the Body Creams

Table 4: Suitability of the products

Sample	PH	%Free Fatty Acid	Colour Change	Odour Change	Body Irritation	Vitamin E (mg/100g)	Vitamin A (mg/100g)
Body cream 1	6.85	13.5	Nil	Nil	Nil	347.15	216.49
Body cream 2	6.85	13.5	Nil	Nil	Nil	347.15	216.49

3.1.3 Clinical Comparative Analysis

Table 5: Clinical Trials.

Person/Day	Antifunbact body cream lotion	Epiderm Cream	Viodurula	Silver lime lotion
1 st Day	No Irritation	No Irritation	No Irritation	No Irritation

1 st Person				
2 nd day 2 nd person	No Irritation or Inflammatory	No Irritation	No Irritation	No Irritation
3 rd day 3 rd Person	Rashes and Pimple began to die appear	Rashes and Pimple still present	Presence of rashes and pimples	Rashes and pimples still present
4 th day 4 th person	Disappearance of pimple, rashes	Rashes and pimples just begin to disappear	Present of rashes and pimples	Rashes and pimple still appeared
5 th day 5 th person	No Irritation rashes and pimples disappeared	Rashes and pimples disappeared	Rashes and pimples begin to disappear	Rashes and pimple still present

3.2 Discussion

The characterization of extract of *cymbopogon ciatrus* was observed in which the colour of the extract was dark green and the appearance was semi-solid sticky shown in table1, while table 2, shown the usual colour of the cream formulated, no considerable change in colour appearance & odour, was observed.

Table 3 and 4 shown that the therapeutic cream formulated contained vitamin E and A. The presence of vitamin E in the cream helps in healthy and proper skin care, while the presence of vitamin A will inhibit the body capacity and fight infection on the body. The same tables indicated that the cream was free of fatty acid and less acidic.

The comparative analysis presented in table 5, showed that there was no irritation, and rashes, pimples, begins to disappear within one week of application. It was equally observed that the presence of *cymbopogon ciatrus* reduced free radical damage in the skin and protect inflammatory in the skin.

4.0 CONCLUSION AND RECOMMENDATION

4.1 conclusion

Effort were geared towards the production of a skin protector using tea leavers that would be beneficial to reduce free radical damage in the skin and has an inhibitory action on collagen, and enzymatic action in the skin.

Also from the result above, antifunbact cream has no irritation on the skin and happens to show positive result on the body. The cream has good physical stability and suitability test, with less free fatty acid.

The application of the cream will help to increase circulation and sort out dry and flaky skin even on the driest and dehydrated skin. It will also increase the softness and smoothness of the skin and the sign of ageing will also be diminished.

Therefore, it could be concluded that antifunbact body cream and lotion is effective to cure pimple, rashes and reduces free radical damage in the skin.

4.2 Recommendation

Owing to the observed medicinal value of *cymbopogon ciatrus*, particularly air dried, it is therefore recommended as follows:

- End User- *Cymbopogon ciatrus* extract of air dried leaves formulated cream is therefore recommended in the treatment of pimples, boils and other inflammatory diseases being an alternative therapeutic agent.
- Researchers- Proper packaging of the cream should be improved upon for exportation. Efforts should also be geared towards the production of skin protection using tea leaves extract. Finally, Cultivation of *cymbopogon ciatrus* plant and other medicinal plant in an appropriate herbarium should be encouraged.

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