

Formulation and Evaluation of Face Serum

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Abstract: *Wrinkles on the face and aging of the skin are an undesirable effect of photodamage and ultraviolet radiation. Serum has a quick absorption and ability to penetrate deep layers of the skin, as well as a non-oily finish and a deep formula with a very high amount of active ingredients. Based on these properties, the purpose of this work was to make serum using polyherbal extract. Aloe vera gel, glycerin, olive oil face serum is a highly concentrated cosmetic product. When we use aloe vera we get not only immediate cosmetic effect but also psychological satisfaction. Aloe vera gel is commonly used to treat various skin ailments, sunburn, minor cuts, insect bites, and is also used as a wound healing, anti-inflammatory, anti-bacterial, and anti-fungal effect. Olive oil has anti-inflammatory properties and is used as a skin moisturizing agent. It also has anti-oxidant properties that can prevent premature aging. Facial serum was tested for its pH, physical appearance, spreadability, viscosity, microbial testing, cyclic temperature test, etc. The results of the stability study show that there was no change in visual acuity, homogeneity.*

Keywords: Face serum, Anti-inflammatory, Evaluation, Premature aging, Penetrate, Active Substances, Polyherbal.

I. INTRODUCTION

Serum is a concentrated product which widely used in Cosmetology. The name comes from itself in professional cosmetology. The cosmetic serum is as concentrated in water or oil as any other cream. Serum, or other concentrated product that contains ten times more organic matter than cream. Therefore, deal with the cosmetic problem quickly and effectively. Rising global cost of living has led to an increase in demand for cosmetic products. The cosmetics industry established in Malaysia is one of the most important economic resources. The value of cosmetics has increased as more and more people want to stay young and attractive. Serum is a skin care product that contains a gel or lightweight lotion or moisturizer and has the ability to penetrate deep to bring the active ingredients to the skin. A good skin serum may give your skin firmness, a smooth texture, make the pores appear smaller and increase moisture levels. Whether it is a moisturizing, anti-aging or anti-wrinkle product or serum for skin, all of these products should contain antioxidants, cell-based ingredients and skin-like ingredients. All skin types need these ingredients to stay as healthy as possible. Gel preparations and Liquids are best for oily skin and a combination, serum and light lotion is best for normal dry skin, more emollients and the best moisturizing creams for dry to very dry skin. Skin texture is all about the skin type but the smart ingredient for healthy skin is the same for everyone, no matter what product, texture or preference you have. The skin is the largest and most protective of the body for 24 hours, but sometimes the skin can become dry for many reasons such as UV rays, dirt, cosmetics left overnight can cause irritation or allergies. Skin serum is a skin care product that you can apply to your skin after cleansing but before moisturizing with the intention of bringing the ingredients directly to the skin. Serum is particularly well suited for this task because it is made up of a small molecule that can penetrate deep into the skin and bring about a very high concentration of active ingredients. This makes them a tool to identify specific skin care concerns, such as color, signs of aging. Cosmeceutical refers to the integration of the cosmetics industry with the pharmaceutical industry. Cosmetic companies produce cosmetics and pharmaceutical companies produce medicines. Cosmeceuticals are skincare products that combine cosmetics with medications. "Cosmetic Product" according to a description from the Guide to the Control of Cosmetic Products, Health Sciences Authorities, Revised 2014, is any product intended to be integrated with various external body parts, such as the epidermis, hair system, nails, lips, eyes, teeth, and oral mucosa and external genitals primarily for cleansing, perfuming, changing their appearance, adjusting body odor, protecting or keeping them in good condition. Available cosmetic products are mainly divided into five

classes namely skin care products, hair care products, and perfumes. Skin care and maintenance includes moisturizers, massage oils, creams, fairness creams, and antiseptic oils. Serum is one of the highest concentrated cosmetic products in its active formula for providing a deep nourishing deep skin layer and a non-oily skin product suitable for skin. Cosmetic serum was classified according to its level of absorption and the ability to penetrate deep layers of the skin. Today, cosmetics are in great demand in everyday life and are used by many people every year.

II. METHOD OF PREPARATION

The emulsion (o / w) was prepared according to the formula given below. The oily component consisting of Olive oil, sandalwood oil, tween 20 and coconut oil is mixed together for 10 minutes to obtain a uniform solution. At the same time the water phase was prepared by mixing aloe vera gel, glycerin, and a small amount of distilled water uniformly. The oil phase is added to the liquid phase by drop wise under mechanical vibration at 2500 rpm to obtain oil in water based on biphasic emulsion.



Fig 1- Prepared Face Serum

Table 1: Composition of Face Serum

Ingredients	Standard Formula (100 ml)	Working Formula (30 ml)
Aloe vera gel	50%	10 gm
Olive Oil	9%	1.8 ml
Sandalwood Oil	0.1%	0.02 ml
Glycerin	25%	5 ml
Coconut Oil	2%	0.4 ml
Tween 20	1%	0.2 ml
De mineralized water	QS to 100 ml	Qs to 30 ml

II. EVALUATION OF FACE SERUM

2.1 Physical Evaluation

The Colour and appearance of the formulation was observed visually. The formulation procedure uniform distribution of extracts. This test was confirmed by visual appearance and by touch.

2.2 pH Value

A pH meter was calibrated using a standard buffer solution. Nearly 1 ml of the face serum was properly weighed and dissolve in 50 ml of distilled water and finally its pH was calculated. The skin has an acidic range and the pH of the skin serum should be in the range of 4.1-6.7.

2.3 Determination of Spreadability

2 gm of serum sample was placed on a surface. A slide was attached to a pan to which 20 gm weight was added. The time (seconds) required to separate the upper slide from surface was taken as a measure of Spreadability.

2.4 Microbial Examination of the Product

In this method, the mixed culture is diluted directly in tubes of liquid agar medium. The medium is maintained in a liquid state at a temperature of 45°C to allow thorough distribution of the inoculum. The inoculated agar medium is transferred into petri plates, allowed to solidify and incubated. In the series dilution technique, the original inoculum may be diluted by using sterile water or saline solution so that the concentration of the microbes gradually become less. Mix 1 ml dilute in 20 ml of liquid nutrient agar medium at 45°C. Shake the liquid agar nutrient agar medium & pour in a sterile petri plate, solidify and incubate it.

2.5 Stability Studies

Formulation and development of a pharmaceutical product is not complete without proper stability analysis carried out on it to determine physical and chemical stability and thus safety of the product. The stability studies is carried out as per ICH guidelines. Short term accelerated stability study was carried out for the period of few months for the prepared formulation. The samples were stored at different storage conditions of temperatures such as 3-5oC, 25oC RH=60% and 40oC±2% RH=75%.

2.6 Cyclical Temperature Test

These test is not carried out at any fixed temperature and humidity. In this test, temperature was changed cyclically every day. At room temperature and frizzling temperature to stimulates the changes in temperature.

III. RESULT & DISCUSSION

3.1 Physical Evaluation

Table 2: Physical evaluation

Colour	White Translucent
Odour	Characteristic Odour
Taste	Tasteless
Texture	Smooth Homogenous
Homogeneity	Good

pH Value:

The pH of formulation was found to be 6.4. As the skin having an acidic pH around 4.1-6.7, this range of formulation is suitable for skin.

Determination of Spreadability

Spreadability of liquid formulation that is ability of the face serum to spread over the skin and play important role in administration of standard dose of medicament formulation on skin. Spreadability of face serum 5 to 6 cm was found.

Determination of Viscosity :\

Viscosity is a critical parameter for topical formulation. Topical solutions with low viscosity have faster clearance than viscous solutions. In addition, highly viscous solutions can have an undesirable effect on the skin. Viscosity of the Face Serum was found to be 13759 Pa. s

Microbial Examination of the Product

The formulation was free from microbes as they do not show zone of inhibition, when they got inoculated in the agar.



Fig 2- Microbial examination of the product

Stability Studies

The formulation was undertaken stability studies for physical and chemical changes. No considerable variations in properties of the formulation were observed.

Table 3 – Stability Studies

Visual Appearance	White Translucent
Phase Separation	Nil
Homogeneity	Good

Cyclical Temperature Test

Table 4 - Cyclical temperature test

Sr. No	Parameter	Stability
1.	Freezer temperature	Unstable
2.	Room temperature	Stable

IV. CONCLUSION

The aim of the study was to formulate different herbals into a serum form moisturizing and glowing activity on skin. Cosmeceuticals are skin-care products that cater both cosmetics and drug. In the serum aloe vera and olive oil are mainly used. The aloe vera gel from the inner central part of the leaf often has a very good action in acne, pimples and other skin problems, burns due to heat, sun exposure and in treatment of radiation dermatitis. Aloe vera is rich in vitamins and minerals that have a good moisturizing capacity and anti-aging effects to maintain healthy- and fresh-looking skin. Olive oil is beneficial for treating sunburn, the antioxidants in to the oil used treat damaged caused by the UV rays. It also slow down and prevent premature ageing. It contains fatty acids such as omega 6 & omega 9, which help to prevent dry skin. Stability studies revealed that there was no significant difference in the physical and pH parameter. Thus, the formulation was found to be stable. Microbial examination of serum revealed that the formulation is free from micro-organism and safe for use. The Spreadability was found to be good. No residues were form and was easy to wash out. The gel stimulates cell growth and as such enhance the restoring of damage skin. So, this serum can be used treat skin related problem.

V. ACKNOWLEDGEMENT

Author take it as a privilege to sincerely express my gratitude to Dr. Subhash Khumbhar, Principle, Samarth Institute of Pharmacy, Belhe for providing project amenities and permission to carry out this work. This author is also thankful to respected Ms Gaikwad S.D, for her valuable guidance, support and encouragement.

REFERENCES

- [1]. Smriti Ojha, Surabhi Sinha, Swadhapiya Das Chaudhari, Hina Chadha. Formulation & Evaluation of Face Serum Containing Bee Venom and Aloe vera gel. 2019, 8(2), 1100-1105.
- [2]. Shan Sasidharan, Pyarry Joseph, Junise. Formulation and Evaluation of Fairness serum using Polyherbal Extract. 2014, 4(3), 105-112.
- [3]. Thanapron Amnuait, Suphatsa Khakhong, Pasarat Khongkow. Formulation Development & Skin Evaluation of Face Serum containing Jellose from Tamarind Seeds. 2019, 2456-9119.
- [4]. S. Budiasih, I Masyitah, K. Jiyuddin, M Kaleemullah, A. D. Samer. Formulation and Characterization of Cosmetic Serum Containing Argan oil as Moisturizing Agent. 2018, 297-304.
- [5]. Akshay D. Thakur. Formulation and Development of De Pigment Serum Incorporating Fruits Extract. 2017, 2(12), 330-382.
- [6]. Silvia Surini, Helmy Mubarak, Delly Ramadan. Cosmetic Serum Containing Grape Seed Extract Phytosome: Formulation and in Vitro Penetration Study. 2018, 10(2), S51-S55.s
- [7]. Maria Teresa Sanz, Celia Campos, Massimo Milani, Monica Foyaca, et al., Biorevitalizing Effect of a Novel Facial Serum Containing Apple Stem Cell Extract, Pro-Collagen Lipopeptide, Creatine, and Skin Aging Signs. 2016, 15, 24-30.
- [8]. Tina-Hua Xu MD, John ZS Chen MD, Yuan-Hong Li MD, Yan Wu MD, et.al., Split-Face Study of Topical 23.8% L-Ascorbic Acid Serum in Testing Photo-Aged Skin. 2012, 11(1), 51-56.
- [9]. W. Philip Werschler MD, Nathan S. Trookman MD, Ronald L. Rizer PhD, et. al., Enhance Efficacy of Facial Hydrating Serum in Subject with Normal or Self-Perceived Dry Skin. 2011, 1385-1394.
- [10]. Aurora Garre, Mridvika Narda, Palmira Valderas-Martinez, Jaime Piquero, Corinne Granger. Antiaging Effects of a Novel Facial Serum Containing L-Ascorbic acid, Proteoglycans and Proteoglycan Stimulating Tripeptide: Ex Vivo Skin Explant Studies and In Vivo Clinical Studies in Woman. 2018, 11, 253-263.
- [11]. Zoe Diana Draelos, Isabel Diaz, Jin Nmakoong, Joanna Wu -Thomas Boyd. Efficacy Evaluation of a Topical Hyaluronic Acid Serum in Facial Photoaging. 2021, 1385-1394.
- [12]. Miss Payal Pramod Jagtap, Miss Bhavana Ravindra Desale, Mr. Vishal Ashok Chaudhari, et.al., Formulation and Development of Anti-Acne Serum Using Euphorbia Hirta. 2020, 2(12), 171-179.
- [13]. Sanela M. Savic, Nebojsa D. Cekic, Sasa R. Savic, Tanja M. Ilic, Snezana D. Savic. 'All-natural' anti-wrinkle emulsion serum with Acmella oleracea extract: A design of experiment formulation approach, rheology and in vivo skin performance/efficacy evaluation. 2021.
- [14]. Mumtaz BT M. Sultan Suhai Buddeen. Optimization, Stability and Characterization of Face Serum Formulation. 2018.
- [15]. Melati Septiyanti, Lilis Liana, Sutriningsih, Bayu Kumayanjati, and Yenny Meliana. Formulation and evaluation of from red, brown and green algae extract for anti-aging base material. 2019, 2175(1).
- [16]. Gabriella Baki, And Kenneth S. Alexander, Ph.D.: Introduction to Cosmetic Formulation and Technology; The University of Toledo, College of Pharmacy and Pharmaceutical Science; 2-3.
- [17]. Shi, V., Tran, K. and Lio, P. (2012). A comparison of physicochemical properties of a selection of modern moisturizers: hydrophilic index and pH. J Drugs Dermatol. 11, 633-636.
- [18]. J.M. Gillbro & M.J. Olsson, the melanogersis of skin Lightening agent-exixting and new approaches International Journal of Cosmetic Science, 2011,33,210-221.
- [19]. Drallos and thaman, "Cosmetic formulation of skin care products" volume 30, 167-180.
- [20]. <http://www.skinbiology.com> Leveque and Agache "Ageing skin, properties and functional changes"
- [21]. https://en.m.wikipedia.org/wiki/olive_oil.