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Preparation of an Organic Skincare Kit using Moringa Oleifera Leaf Extract

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Abstract- *Many individuals suffer from acne and other related skin problems due to their stressful lifestyles. There is a demand for skin-friendly and sustainable products to combat the harsh effects of this. Moringa oleifera leaves are known to possess an antimicrobial compound, Aglycon of Deoxy-Niazimicin (N-benzyl, S-ethyl thioformate), which is known to possess a strong action spectrum against Staphylococcus aureus, which is believed to be the primary causative agent of acne. Apart from that it contains many bioactive compounds like flavonoids, vitamins, which can protect the skin cells from the repercussions of underlying developing oxidative stress. These properties of M. oleifera leaves have been utilized to create a skincare kit consisting of a nourishing face gel and face wash to combat the aforementioned problems. Our product not only aims at eradicating acne-related problems, but also in enriching the skin's natural health and longevity. The materials and methods adopted to formulate the products have been discussed with emphasis on composition of the products. Furthermore, the scope of the product and other natural alternatives to skincare products was addressed.*

Key Words: **Dermatology, natural, skincare, *Moringa olifera,* acne, leaves**

1. INTRODUCTION

Infectious disease is the most commonly occurring ailment in the population of developing countries including India. One of the major causes of these are bacterial species. One of the most common body parts where bacterial infestation is more pronounced, is the skin. The skin forms the first line of defence and is often the attacking surface for a variety of pathogens, especially Staphylococcus species. The antibiotic ointments supplied often become ineffective due to development of biofilms by the pathogens and even if they prove to be effective, they corrode the underlying skin, thereby leading to an observed deterioration in the overall skin quality. Almost every human being faces dry skin during their life. Conditionally, this is further propelled by the lack of hydration, a stressful lifestyle and high pollution in the environment. This not only makes the skin crack but also makes it susceptible to infections and pimples and if left untreated, can result in chronic acne. *Moringa oleifera* (Family: Moringaceae) is well – known for its various medicinal properties. The leaves of the Moringa plant (Moringa oleifera) contain several bioactive compounds of importance such as: flavonoids, phenolic acids, or carotenoids. It also contains such components as, vitamins (A, C, niacin, pantothenic acid), alkaloids, tannins or saponins. It is known that tannins and flavonoids are the bioactive compounds in *Moringa oleifera* L. moringa leaf extract with ethanol solvent that can inhibit the formation of *S. aureus* extracts. The chemical components/molecules extracted from the leaves of *Moringa oleifera* L. have a strong antioxidant, toning and anti-inflammatory effect. This is based on the experimental results that showed that the tested extracts may affect the increase of cell proliferation and reduce oxidative stress in human cell lines like keratinocytes and fibroblasts. The addition of the tested bioactive extracts to the model cosmetic formulation, contributed to the reduction of skin irritation and significantly improved the safety with the usage of the product.

2. MATERIALS AND METHODOLOGY

2.1 Materials

2.1.1 Formulation for facewash

Table -1: Facewash

Ingredients	Concentration (w/w %)	Function
Coco glucoside	10	Foaming agent
Peptides	2.5	Anti-wrinkling, promotes collagen formation
Salicylic acid	2: for normal skin 0.5-1: for oily skin	Exfoliating properties, reduces swelling
AHA	10	Exfoliator, reduces acne

Vitamin E	0.5	Free-radical scavenger, protects from UV
Microcrystalline cellulose	10	Scrubbing beads, alternative to non-biodegradable plastic beads
Water	20	Solvent
Glycerine	20	Emollient
Oils		
Rosehip oil	2.5	Reduces acne and lightens skin tone
Argan oil	2.5	Reduces lines and wrinkles, enhances skin elasticity
Glycine soja oil	2.5	Essential amino acid, acts as emollient
Plant extracts		
Moringa leaves	10%- extract	Anti-inflammatory, anti-oxidant properties
Neem leaf	9	Helps heal damaged skin, reduces acne, hydrates skin, contains vitamins and minerals

2.1.2 Formulation for Face gel

Table -2: Gel

Ingredients	Concentration (w/w%)	Function
Water Phase		
Deionised water	35	Solvent
Potassium sorbate	0.5	Used to preserve the gel and increase shelf life
Glycerine	23	Moisturizer
Oil phase		
Lavender oil	1	Reduces acne, lightens skin tone, reduces lines and wrinkles
Glycine soja oil	1	Emollient, contains essential amino acids
Panthenol	0.1	Soothes skin and moisturizers
Part III		
Aloe extract	35	Helps heal damaged skin, reduces acne, hydrates skin, contains vitamins and minerals
Limonene	0.005	Anti-oxidant, fragrance agent
Moringa leaf extract	1.5	Anti-inflammatory and anti-bacterial
Butylene glycol	2.895	Moisturizers skin and makes gel easier to apply

2.2 Methods

2.2.1 Preparation of *Moringa oleifera* extract:

The *Moringa* tree leaves (*Moringa oleifera* L.) were dried with warm air at 40° C for 2 days. 0.5 g of material from the plant was extracted with 25 ml of 70% ethanol in water solution and macerated. After this, this extracted material was placed on a stir-plate, for 1hr, at room temperature. The sample was centrifuged for 10 min at 984xg to get rid of solid particles. The solvent was evaporated employing a rotary evaporator at 40° C and the dried residue was redissolved in 2ml 70% ethanol. The solution was filtered through Whatman filter paper No. 10 and kept at -20° C in amber bottles to avoid degradation.

2.2.2 Applicative Face Gel

Aloe vera gel is homogenised in a blender and filtered to remove suspended residues and other impurities. The filtrate obtained was heated with water. There will be formation of froth, which must be skimmed off. The mixture was further heated until it reduces in volume and concentrates. 1 mg agar-agar powder was mixed in uniformly and the mixture was allowed to cool. After cooling, the prepared M. olifera leaf extract along with the part III ingredients and further active ingredients including the oil phasic and water phasic ones were added in succession and in accordance with the composition chart to make the finished gel.

2.2.3 Applicative Face wash

De-ionized water was taken, and Coco glucoside and glycerine were added and mixed until the solution became highly homogenous. Then AHA, moringa leaf and neem leaf extract were taken and added to the mixture and mixed thoroughly for 10 minutes. The essential oils like Rosehip oil, Argan oil, Glycine soja oil were added to the mixture and mixed for another 10 minutes. Finally, the peptides and Vitamin E were added as a skin matrix base and preservative respectively and mixed for another 10 minutes. Lastly, the microcrystalline cellulose beads were added and the whole mixture thoroughly mixed and stored under appropriate conditions.

3. RESULTS AND DISCUSSION

In the present day and age, skin issues such as acne are extremely common, especially among the youth. Customers tend to lean towards chemical skincare products due to their fast action and easy availability. However, chemical-based cosmetics, although currently prevalent in the market, pose extreme threats to skin health on a long run. Their production is harmful to the environment as well due to the excessive amounts of chemical pollutants released. There is a great demand in the market for products that are not only effective, but also gentle on the skin and environmentally conscious.

Hence, we propose our product as a sustainable solution to these problems. The leaves of *M. oleifera* have been used as the key ingredient in the formulation of a skincare kit containing two organic skincare products - a face wash and a gel. *M. oleifera*, having strong antioxidant and antimicrobial properties, especially against *S. aureus*, is highly effective as an active ingredient in skincare. Our products containing *Moringa* leaf extracts are not only harmless due to the presence of natural ingredients, but also help in revitalising skin and making it smooth and supple. The addition of other ingredients like aloe and neem enhance the intrinsic properties of *Moringa*, keeping the skin moisturised and clean. The gel and face wash have a mild and calming aroma.

The key ingredient *Moringa* can be easily grown and harvested within India itself. This will ensure that our company contributes to society as well, by providing jobs and income for local farmers. The proximity of the farms to the processing units can also greatly reduce transportation costs and fuel consumption, indirectly lessening pollution levels.

On the note of decreasing pollution, we used microcrystalline cellulose beads which would act as a scrubbing agent. Normally face wash products would contain microbeads made from plastic, these plastic beads being non-biodegradable would accumulate and harm the environment. Microcrystalline cellulose is biodegradable and will not accumulate and add to the already existing pollution crisis. At the same time the other ingredients such as glycerine and the different oils added allow the beads to be coated with a smooth layer to prevent the beads from being too rough on the skin while performing its function.

4. CONCLUSION

Our statistics showed that over 73% of our customer base sees a need for herbal cosmetic products in the skincare market. Most herbal products contain natural additives such as waxes, oils, fragrance agents and other beneficial chemicals which can extracted from certain plant parts especially leaves. There is a large scope for utilisation of the untapped potential that lies in these natural ingredients, to invent solutions for skincare that are effective and, at the same time, gentle on the skin. More research and development resources must target this aspect of biocosmetic engineering, to prove effectiveness of herbal cosmetics and to integrate them more seamlessly into the market. Care must also be taken to perform proper safety testing of the products, according to the existing regulations and requirements. Keeping with our goal of remaining true to nature and causing the least harm possible, it is important to avoid unethical practices

such as animal testing. Of the various herbs present in nature which are rich in bioactive compounds, a topical formulation of Moringa extract is capable of revitalizing the skin and reducing signs of skin blemishes and other skin disorders, a naturally derived skincare product was made to tend to the increasing demands of people wanting products with optimum performance and lesser side-effects. The formulation can be further investigated for materials to enhance the bactericidal activity and for further economic balancing of cost structure

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