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THE FORMULATION AND EVALUATION OF ANTI-AGING CREAM FROM *MORINGA OLEIFERA*

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ABSTRACT
Herbal medicine is an old tradition, with plants being used for many years to treat a varietyof health issues, including skin problems caused by infections and other factors. Some plants have antimicrobial properties because they contain substances like flavonoids, triterpenes, and tannins. In India, many herbs used for beauty treatments are from Ayurveda, and they can often be found locally. Researchers have studied moringa leaves and their anti-aging benefits when used in creams and nano emulsions. Moringa is believed to protect against UV rays and improve skin moisture. It is rich in antioxidants and vitamins like C, B, and A. Studies have shown that moringa-based creams can effectively hydrate and improveskinhealth, making it a promisingingredientfor skincareproducts.

KEYWORDS: Moringaoliefera, Herbal Cream, Antiaging, Vitamins, Antioxidant.

INTRODUCTION

Moringa oleifera is a plant with several nutrients rich in vitamins, proteins, minerals, and fibers that result in the explicit properties of this miracle plant. Research has reported that Moringa leaves are abundant in protein content in comparison to other leaves consumed as food. They are rich in in zeatin, quercetin, kaempferol, and various other phytochemicals, proving the nutritional source of the plant The leaves are also high in essential amino acids such as methionine, cysteine, tryptophan, and lysine. In some parts of India, fresh leaves are used to make cowand buffalo ghee, as these leaves possess rich antioxidantsthat enhancetheshelf life ofghee.

The process of creating and analysing a skincare product using moringa as a primary ingredient is known as the formulation and evaluation of herbal Moringa moisturising cream. Choosing the right ingredients, figuring out how much of each, and streamlining theproduction process are all part of the Formulation process. The process of evaluating a cream usually entails testing it using techniques including rheological analysis, stability studies, sensory Evaluation, and skin patch tests to determine its moisturising efficacy, stability, texture, aroma, and skin compatibility. Moringa is a promising ingredient Forthesekindsofformulations becauseofits moisturising and antioxidant qualities.

Fig. 1: Moringa Oleifera.

Moringa oleifera L. Is the most widely farmed; also native to many regions of Africa, Southeast Asia, and South America. The popularity of moringa as a miracle tree has been described in numerous studies that have been published in the past tenyears. The plant iswidely recognised for its nutritionalvalueand its antioxidant, anticancer, andanti-inflammatory.

Plant profile
Synonyms: Guilandina *moringa L.*

Kingdom: Plantae.
Clade: Tracheophytes
Clade: Angiosperms.
Clade: Eudicots
Clade: Rosids.
Order: Brassicales
Family: Moringaceae.
Genus: Moringa
Species: M. oleifera.

Creams are externally applied medication forms. Usually, they are viscous liquids or semi-solid emulsions. Creams can be either water-in-oil or oil- in-Water (o/w).It is frequently referred to as the "drumstick tree" and is extensively utilised in herbal and culinary preparations. Leavesaresaid to have Purgativequalities.

Benefits of Moringa Moisturizing cream
- Moringacanhelp to balanceoutthesetraitsand giveyou a radiant, healthyappearance.
- Improve overall complexion.
- Used asamoisturizerand spotremover.
- Moringa containsvitamin C, vitaminand potassium
- Nourishesand moisturisesyour skin.
- Gives a glowing and rosy skin.

Fig. no. 2: Moringa olifera fruit.

Taxonomical Profile
French botanist François Alexandre Pierre de Garsault described the species as Balanusmyrepsica, but his names are not accepted as valid, as he did not always give his descriptions binomial names.French naturalist Jean-Baptiste Lamarck described the species in 1785. A combined analysis of morphology and DNA shows that M. oleifera is most closely related to M. concanensis, and thecommonancestor ofthese two divergedfromthe lineageof M. peregrina.

Ecology
The moringa tree is not affected by any serious diseases in its native or introduced ranges. In India, several insect pests are seen, including various caterpillars such as the bark- eating caterpillar, the hairy caterpillar, or the green leaf caterpillar. Budworms from the Noctuidae are known to cause serious defoliation. Damaging agents can also be aphids, stem borers, and fruit flies. In some regions, termites can also cause minor damage. If termites are numerous in soils, insect- management costsarenot bearable.

The moringa tree is grown mainly in semiarid, tropical, and subtropical areas, corresponding in the United States to USDA hardiness zones 9 and 10. It tolerates a wide range of soil conditions, but prefers a neutral to slightly acidic (pH 6.3 to 7.0), well-drained, sandyorloamy soil.

Moringa oleifera L. is the most widely cultivated of the 13 Species of family Moringaceae that is native to the sub Himalayan tracts of India, Pakistan, Bangladesh, Afghanistan, andNepal, which is now indigenous to Regions Africa, Southeast Asia, and South America (Fahey, 2017). A plethora of studies that have been published in The decade describe the popularity of moringa asa miracle Tree. It is wellknownplant for nutritionalaswellas Potentialantioxidant(Bharalietal., 2003), anticancer, antiinflammatory, antidiabetic, antimicrobial agent and Possesses numerous medicinal qualities (Mahmoodet al., 2010).

Several valuable reviews of the ethnobotanical uses Of M. oleifera L are available with a variety of potential uses (Hussain et al., 2014, Aney et al., 2009). The leaves haveBeen established as a rich source of phenolics and Glucosinolates (Sreelatha & Padma, 2009; Amaglo et al., 2010), carotenoids (Saini et al., 2014), isothiocyanates (Waterman et al., 2014) and various protein, vitamins, Amino acids and phenolics (Anwar et al., 2007). It has also Long been labeled for its great cosmetic value in which in Recent years, commonly found to be used in various health Care products such as moisturizers and conditioners. Moisturizers containing herbal antioxidants

are active for Dry skin, daily safeguarding of normal skin, and adjunctive Therapy related to many skin diseases (Dal'Belo et al., 2006). Phenolic antioxidants inhibit inflammation, which leads to Collagen improvement, and may offer protection against Skin photo- damage. Creamcontainingleafextract is a Naturaleffectiveingredient for improvinghydration.

Fig. 3: Moringa olefira leaves.

Which Can be used in moisturizing cosmetic formulations and also To complement the treatment of dry skin (Sahu et al., 2011; Ali et al., 2013; Gyawali & Paudel, 2022). Skin careherbal Products that claim therapeutic benefit from addition of Plant extractsand active ingredientssuchas -hydroxy Acid, retinoic acid, ascorbic acid and coenzyme Q10 (Gyawali et al., 2020; Gyawali et al., 2016; Kumar et al., 2016; Knott et al., 2015).

To promote the use of Nepalese medicinal plants as Potential sources of skin care products, it is important to Thoroughly find out theirphytochemicalprofile, bioactive Properties, and designa suitableformulation. Undertaking Theseprecedents into consideration, the aim of this study Was to evaluate the phytochemical constituents and Antioxidant activity of ethanolic extracts of M. oleifera and Then develop a functional cream.

Preparation of Plant Extracts

The leaves were sun dried, grinded into powder, and Passed through 80 size sieving trays. Extraction was Carried out in ethanol by using Soxhlet apparatus for Continuous 8 hours attemperature and then evaporated by Using rotavapor (Buchi R-215, Switzerland), 75-90 RPM, Under 100 mbar pressure maintaining 40℃ temperature of Water bath.

Preparation of cream

Cream wasprepared usingfusionmethod.

- By taking cream base Beeswax 3.2 gm and add liquid paraffin as a softening agent 4gm in a beaker. Heat water bath and Mixwellmelted.

In another beaker take distilled water 3.3 ml add emulsifying agent borax 0.16 gm. Mixwell in water bath.

- Add methylparaben in Beeswaxsolution.
- Both oil and aqueous phase were mixed at 70 °c in the mortar and mix continuously until a homogeneous product was formed.
- 3ml Moringa extractand chandanpowder 0.02 gm wasadded to it withcontinuoustratution
- Reactionmixturewashomogenised bymixer intoa creamform.

Ingredients

Ingredients	Role of Ingredients
Bees wax	Emulsifying agent
Liquid paraffin	Emulsifying agent
Borax	Emulsifying agent
Water	Vehicle
Moringa leave extract	Antiaging
Methyl paraben	Preservative
Propyl paraben	Preservative
Rose water	Perfume
Chandan powder	Anticeptic

Evaluation of creams

- **Viscosity** -The herbal cream's viscosity was measured using a Brookfield viscometer, with the angular velocity increasing from 0.5 to 20 rpm.

- **Test for microbial growth in formulated cream-** The cream was tested for microbial growth using streak plate method on agar media plates, then Incubated at 37°C for 24 hoursbeforecomparisonwiththecontrol.

- **Homogeneity and Appearance**: After the cream was set in the container, it was evaluated for homogeneity visually and physically. Theappearance Wasdetermined bylookingatthepearlescence, roughness, andcolour.

- **Grittiness**: Acompound microscope was used to inspect the formulation for particles.

- **Determination of pH-** pH measurement involved calibrating the pH metre using a standard buffer solution, then taking 0.5g of the prepared herbal Cream and thoroughly mixing it with 50 ml of distilled water. The pH metre was then used to measurethecream'spHat roomtemperature.

- **Spreadability**: The time it takes for two glass slides to separate from cream is measured in seconds; the shorter the duration, thebetterthespreadability.

- **Sterility test**:- evaluation of the creams sterility using techniques like membrane filtration or direct inoculation.

Morphology
Moringa oleifera is a small fast – growing evergreen or deciduous tree usually grows up to 10 or 12 m in height. It has spreading, fragile branches, feathery foliage of tripinnate leaves, and whitish gray bark.

Leaves
The leaves are bipinnate or commonly tripinnate up to 45 cm long the leaflets are hairy, greenand almost hairless on the upper surface. The twigs are hairy and green, these are compound leaves with leaflets of 1–2 cm long.

Flowers
The fragrant, bisexual, yellowish white flowers are hairy stalks in spreading or drooping axillary panicles 10 – 25 cm long. Individual flowers are approximately 0.7 to 1 cm long and 2 cm broad and five unequal yellowish – white, thinly veined, spathulate petals, five stamens with five smaller sterile stamens and pistil composed of a 1-celled ovary and slender style.

Fruits
Fruits are tri – lobed capsules and are referred to pods it is pendulous, brown triangular, and splits into three parts lengthwise when dry 30 – 120 cm long, 1.8 cm wide fruits production mostly occurs in march and april. Fruit contain around 26 seeds during their development stage. Immature pods are green in color they turn brown on maturity

See
Seeds are round 1cm in diameter with brownish semi – permeable seed hull with 3 papery wings hulls of seed are brown to black but can be white if kernels are of low viability. Viable seed germinate within 2 weeks, each tree can produce around 15,000 to 25,000 seeds/year. Average weight is 0.3 gm/seed. The parts of plant Moringa oleifera.

Pharmacological Activity
The plant Moringa oleifera posses broad pharmacological activities. Some of them are discussedbelow.

Antioxidant activity
Aqueous and alcoholic extracts (methanolic & ethanolic) of leaves and roots of Moringa oleifera exhibit strong in-vitro anti-oxidant and radical scavenging activity. Its leaves are rich source of antioxidant compounds; they could protect the animals against diseases induced by oxidative stress. Administration of Moringa oleifera leaves extract seems to prevent oxidative damage caused by high-fat diet.

Antiepileptic activity
Methanolic extract of Moringa oleifera leaves exhibit potent anti-convulsant activity against pentylenetetrazole and maximal electroshock induced convulsions at the dose levels of 200 mg/kg and 400 mg/kg administered intraperitonially. Diazepam and phenytoin were used as reference standard. Methanolic extract significantly delayed the onset of seizures in Ptz induced convulsions and significantly reduced duration of hind limb extension in MES test at both the dose levels. This may be because of the presence of alkaloids, flavonoids and tannins present inthe extract.

Anti-diabetic activity
Aqueous extract of Moringa oleifera leaves shows anti-diabetic activity and controls diabetes and thus exhibit glycemic control.

Cardiovascular activity
Ethanolic extract of Moringa oleifera leaves showed prominent anti-hypertensive or hypotensive activity. The in-vivo activity was done in animal's heart and it was found that thiocarbamate and isothiocyanate glycosides were responsible for this powerful hypotensive activity.

Plantation and soil conditions
- M. oleifera can be grown in any tropical or subtropical climate with temperatures Between 25 and 35 degrees Celsius. It needs sandy or loamy soil with a slightly acidic to slightly alkaline pH and 250-3000 mm of net rainfall. Because of the high germination rates, the direct sowing approach is used.
- Moringa seeds can be put at a depth of 2 cm in the soil and are expected to germinate in 5-12 days after seeding. The nutritional components of a tree grown in India and a tree cultivated in Nigeria are slightly different.
- It was discovered that the latter was less nutritious than the former, which was ascribed to the Savannah regions' high temperatures. Proteins and enzymes denature at higher temperatures, which could explain the nutrient content discrepancy.

Nutratative Properties

- M. oleifera contains a wealth of vital nutrients and antinutrients in every region of the plant. Minerals such as calcium, potassium, zinc, magnesium, iron, and copper are abundant in the leaves of M. oleifera.
- Vitamins such as beta-carotene (vitamin A), folic acid, pyridoxine, and nicotinic acid (vitamin B), vitamin C, D, and E are also found in M. oleifera. Moringa leaves are very low in calories and can be included in an obese person's diet. The fibrous pods are usefulfor treating digestive issues and preventing colon cancer.
- Moringa has a variety of nutrients that are necessary for human growth and development, including calcium, which is one of the most important elements for human growth. While it ounces of milk contains 300-400 mg of moringa, moringa leaves have 1000 mg, and moringa powder contains around 4000 mg.

Medicinal Properties

- Anti-diabetic properties: Both Type 1 and Type 2 diabetes have been found to be cured with moringa. Moringa has been demonstrated to have anti-diabetic properties in severalinvestigations.
- Anticancer properties: Cancer is a frequent disease, and poor medicine is responsible for
- One out of every seven fatalities. At established quantities, M. oleifera can be employed as an anticancer drug because it is natural, reliable, and safe. Moringa has been proven in studies to be an anti-neo proliferative drug, slowing the proliferation of cancer cells.
- Other diseases: Moringa can be used as a potent neuroprotectant. Moringa is prescribed by herbal practitioners for patients with AIDS. Moringa is suggested to be included in the diet, with the view of boosting the immune system of HIV positive individuals.

Commercial Application

- Moringa seeds are used to extract oil called the Ben oil. This oil is rich in oleic acid, tocopherols and sterols. It can also withstand oxidative rancidity. The oil can be used in cooking as a substitute for olive oil, as perfumes and also for lubrication.
- Moringa seed extract has the ability to eliminate heavy nietals (such as lead, copper, cadmium, chromium and arsenic) from water.
- Moringa seeds can be used in cosmetics and are sources of biodiesel while the seedcakes, can be used as a green manure or a fertilizer.

CONCLUSION

- ❖ Research and development for the formulation of Herbal Anti-aging cream was to supportslowing down the signs of aging.
- ❖ The cream does not cause any skin irritation and hazardous or hypersensitive reactions. Discovered to be abundant in phenolic compounds withstrong antioxidant capabilities.

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