

A REVIEW OF MULTIPURPOSE HERBAL CREAM

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ABSTRACT

The increasing interest in naturally derived cosmetic products has encouraged the development of herbal formulations for skin care and cosmetic applications.^[1] Herbal creams are semisolid topical preparations containing plant-derived materials that may provide moisturizing, antioxidant, antimicrobial, soothing and skin-conditioning effects.^[1,2] The biological activities of herbal creams are associated with the diverse phytoconstituents present in medicinal plants, including polyphenols, flavonoids, terpenoids, alkaloids, enzymes and vitamins.^[2,3] Multipurpose herbal creams may combine several functional ingredients in a single formulation to provide complementary skin-care benefits such as moisturization, protection, conditioning and support for healthy skin.^[1,4] However, the natural origin of an ingredient does not automatically establish its safety, and appropriate quality control, stability and safety evaluation are necessary for herbal cosmetic formulations.^[1,9] This review discusses cosmetics, skin care, common skin problems, herbal creams, commonly used ingredients, methods of preparation and evaluation parameters relevant to multipurpose herbal cream formulations.^[1,4]

KEYWORDS: Herbal cream, multipurpose cream, herbal cosmetics, topical formulation.

INTRODUCTION

The use of natural substances for maintaining personal appearance and skin health has a long history across different cultures.^[1] In recent years, consumer interest in naturally derived cosmetic products has contributed to increased research into herbal and plant-based formulations.^[1] Herbal cosmetic preparations contain plant materials or plant-derived constituents that may contribute antioxidant, antimicrobial, anti-inflammatory, moisturizing or skin-conditioning activities.^[1,2] The cosmetic potential of medicinal plants is associated with their chemically diverse phytoconstituents, which may act through different biological mechanisms.^[2,3] However, herbal formulations may present challenges related to standardization, stability, contamination, ingredient variability and reproducibility.^[1,9] Therefore, systematic formulation development and evaluation are important for establishing the quality and safety of herbal cosmetic products.^[1,9] A multipurpose herbal cream is a topical semisolid formulation designed to incorporate ingredients that can provide more than one skin-care function within a single preparation.^[1,4] Such formulations may be designed to provide moisturization, emollience, skin conditioning, antioxidant protection and supportive antimicrobial activity depending on the selected ingredients.^[1,4] The combination of several botanical ingredients may provide complementary activities, although the compatibility and stability of each component must be established experimentally.^[1,9] The final product should possess acceptable physical properties, ease of application and adequate stability during storage.^[4,10]

COSMETICS

Cosmetics are products primarily intended for cleansing, beautifying, promoting attractiveness or altering the appearance of the external parts of the human body.^[11] Cosmetic preparations may be formulated for the skin, hair, nails, lips and other external body surfaces.^[11] Skin-care cosmetics include products such as creams, lotions, gels, cleansers, moisturizers, sunscreens and masks.^[1,11] These products may contain functional ingredients together with excipients that determine their texture, stability, spreadability and sensory characteristics.^[1] Modern cosmetic formulations increasingly incorporate naturally derived materials because of consumer interest in plant-based products.^[1,2]

TYPES OF COSMETICS

Cosmetic products can be broadly classified according to their intended area of application and function.^[11] Skin-care cosmetics include cleansers, moisturizers, creams, lotions, gels,

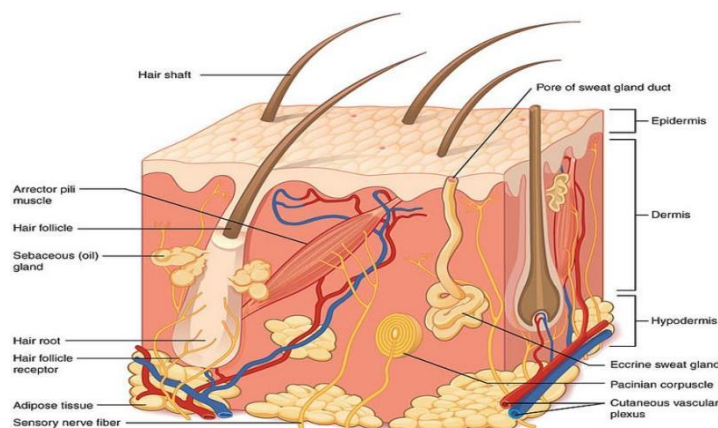
masks and exfoliating preparations.^[1,11] Hair-care cosmetics include shampoos, conditioners, hair oils and styling preparations.^[11] Colour cosmetics include products such as foundations, lipsticks, rouges, eye cosmetics and related decorative preparations.^[11] Fragrance products include perfumes, deodorants and other preparations intended primarily to impart or control body odour.^[11] Sun-care products are designed to help protect the skin from ultraviolet radiation and may contain ultraviolet filters or other protective ingredients.^[1,11]

POTENTIAL BENEFITS OF HERBAL COSMETICS

Herbal cosmetics provide an important source of naturally derived ingredients for cosmetic and skin-care formulations.^[1] Plant materials contain diverse constituents such as polyphenols, flavonoids, terpenoids, alkaloids and vitamins that may possess biological activities relevant to skin care.^[2,3] Several botanical ingredients have demonstrated antioxidant activities that may help counter oxidative processes associated with environmental skin stress.^[3] Some plant-derived substances have also demonstrated antimicrobial or anti-inflammatory activities in experimental studies.^[5,6] Herbal-derived products can therefore provide opportunities for developing multifunctional cosmetic preparations containing several naturally derived active materials.^[1,2]

SKIN

The skin is the largest organ of the human body and forms an important interface between the internal environment and the external environment.^[12] It contributes to protection against physical, chemical, microbial and ultraviolet challenges.^[12,13] The skin also participates in regulation of body temperature, sensation, immune defence and prevention of excessive water loss.^[12,13] The major layers of the skin are the epidermis, dermis and subcutaneous tissue.^[12,14] Hair follicles, sebaceous glands and sweat glands are important appendages associated with the skin.^[14]



The epidermis is the outermost major layer of the skin and provides an important protective barrier between the body and the environment.^[12,14] Keratinocytes are the predominant cells of the epidermis and undergo continuous proliferation, differentiation and shedding.^[14] The principal epidermal layers include the stratum basale, stratum spinosum, stratum granulosum and stratum corneum, while the stratum lucidum is present in thick skin such as the palms and soles.^[14] The stratum corneum provides an important barrier against water loss and environmental substances.^[13] Melanocytes and other specialized cells are also present within the epidermis and contribute to pigmentation and other skin functions.^[14] The dermis is a connective-tissue layer located beneath the epidermis and provides structural support to the skin.^[14] It contains collagen, elastin, extracellular matrix components, blood vessels, nerves and skin appendages.^[14] Collagen contributes substantially to the tensile strength of the skin, while elastin contributes to its elasticity.^[14] The dermis also contains fibroblasts that synthesize important extracellular matrix components.^[14] The subcutaneous layer, or hypodermis, lies beneath the dermis and contains substantial adipose tissue and connective tissue.^[12,14] This layer contributes to insulation, energy storage and mechanical cushioning of underlying structures.^[12] It also provides structural continuity between the skin and deeper tissues.^[14]

FUNCTIONS OF SKIN

The skin forms a physical barrier that helps protect the body from environmental hazards and microorganisms.^[12,13] The epidermal barrier also limits excessive transepidermal water loss and helps maintain skin hydration.^[13] The skin participates in thermoregulation through mechanisms involving blood flow and sweat production.^[12] Sensory receptors within the skin allow perception of touch, pressure, temperature and pain.^[14] The skin also possesses important immune functions involving keratinocytes, immune cells and antimicrobial mechanisms.^[13] Maintaining the integrity of the skin barrier is therefore important for normal skin function and appearance.^[13]

SKIN CARE

Skin care refers to practices and products intended to maintain the cleanliness, hydration, barrier function and overall appearance of the skin. Appropriate skin care can help support the epidermal barrier and reduce excessive dryness.^[15] Moisturizers are particularly important because they can improve skin hydration through combinations of humectants, emollients and occlusive agents.^[15,16] Cleansing removes unwanted substances from the skin surface but

excessive or inappropriate cleansing can disturb barrier function.^[15] Cosmetic formulations can therefore be designed to support different aspects of skin care according to the intended skin type and purpose.^[1,15]

TYPES OF SKIN CARE

Skin-care practices commonly include cleansing, moisturization, exfoliation and protection from environmental factors.^[15,16] Cleansing helps remove sweat, sebum, microorganisms, cosmetics and environmental contaminants from the skin surface.^[15] Moisturization helps improve the water content and physical properties of the stratum corneum through humectant, emollient and occlusive mechanisms.^[15,16] Exfoliation removes or promotes removal of superficial corneocytes and may improve the texture of the skin when appropriately performed.^[17] Photoprotection is important because ultraviolet radiation contributes to photoaging, pigmentation and other forms of cutaneous damage.^[3,18]

COMMON SKIN PROBLEMS

Skin disorders and cosmetic concerns can arise from genetic, environmental, inflammatory, infectious and lifestyle-related factors.^[19] Acne is a common inflammatory disorder involving the pilosebaceous unit and may result in inflammatory lesions and post-inflammatory changes.^[19] Xerosis is characterized by dry skin and may involve increased transepidermal water loss and impaired barrier function.^[15] Dermatitis includes inflammatory skin conditions that may be associated with erythema, itching, dryness and disruption of the skin barrier.^[15,19] Photoaging results from cumulative environmental exposure, particularly ultraviolet radiation, and can contribute to wrinkles, pigmentation changes and loss of elasticity.^[3,18] Hyperpigmentation may result from increased or uneven melanin production and can have multiple underlying causes.^[18]

DIFFERENT SKIN-CARE FORMULATIONS

Skin-care products are formulated in different dosage forms according to the desired application, sensory characteristics and release properties.^[1,20] Creams are semisolid emulsions that can provide both aqueous and oily components in a relatively cosmetically acceptable form.^[20] Lotions are generally less viscous than creams and are useful when easy spreading over larger skin areas is required.^[20] Gels are semisolid systems containing a liquid phase immobilized within a polymeric or colloidal network.^[20] Ointments are greasy semisolid preparations that can provide substantial occlusion and are particularly useful for

dry skin.^[15,20] Face masks and scrubs are other topical cosmetic preparations that may be designed for cleansing, exfoliation or conditioning of the skin.^[1]

1. Creams

Creams are semisolid emulsions consisting mainly of oil and aqueous phases and are among the most widely used formulations for skin care.^[1] They may be formulated as oil-in-water (O/W) or water-in-oil (W/O) emulsions depending on the composition and intended application.^[1] Creams provide moisturizing and emollient effects while generally being less greasy and easier to spread than ointments.^[1,2] They can accommodate both hydrophilic and lipophilic ingredients and are therefore suitable for incorporating a wide range of cosmetic and herbal constituents.^[3] Their pleasant texture and ease of application make creams particularly suitable for routine facial and body skin care.^[1]

2. Lotions

Lotions are relatively fluid topical formulations that spread easily over large areas of the skin.^[1] They are commonly prepared as oil-in-water emulsions containing a high proportion of aqueous phase, which gives them a light and easily spreadable consistency.^[1,2] Lotions provide a cooling sensation because of evaporation of the aqueous phase after application.^[1] They are particularly useful for large or hairy areas of the body where application of thick semisolid preparations may be inconvenient.^[1] However, lotions generally provide less occlusion and hydration than creams and ointments.^[1]

3. Ointments

Ointments are semisolid preparations containing a relatively high proportion of oily or occlusive materials.^[1] They form a protective film over the skin and reduce transepidermal water loss, thereby helping to maintain skin hydration.^[1,2] Ointments are particularly useful for dry, rough, and thickened skin because of their strong emollient and occlusive properties.^[1] Hydrocarbon bases, absorption bases, emulsion bases, and water-soluble bases are commonly used for the preparation of ointments.^[1] Their greasy texture and difficulty in removal may reduce cosmetic acceptability compared with creams and lotions.^[1]

4. Gels

Gels are semisolid formulations in which a liquid phase is immobilized within a three-dimensional polymeric network.^[2,4] They can be prepared as hydrophilic or hydrophobic systems depending on the nature of the liquid phase and gelling agent used.^[2] Hydrophilic

gels generally provide a light, non-greasy feel and are easily washed from the skin.^[1] They are particularly suitable for oily skin and hairy areas because they spread easily and do not produce a heavy occlusive layer.^[1] Gels may also provide a cooling sensation and are widely used in cosmetic and dermatological preparations.^[1]

5. Pastes

Pastes are stiff semisolid preparations containing a relatively high concentration of finely divided insoluble solid materials dispersed in a suitable base.^[2,5] Their high solid content gives them greater consistency and makes them remain at the site of application for a longer period.^[5] Pastes can provide protective and absorbent effects and are useful when a formulation needs to remain localized on the skin.^[2] They are generally less spreadable than creams and ointments because of their high proportion of solid particles.^[5] Their use in skin care is therefore more specialized than that of creams and lotions.^[2]

6. Solutions

Topical solutions are liquid preparations in which the active or functional ingredients are completely dissolved in a suitable solvent or solvent system.^[1,4] They are generally homogeneous and can be applied easily to the skin or scalp.^[1] Solutions are particularly useful for hairy areas because they can spread rapidly without leaving a thick residue.^[1] Their low viscosity allows rapid application over relatively large areas.^[1] However, solutions may provide less moisturizing and occlusive activity than semisolid formulations such as creams and ointments.^[1]

7. Sprays

Sprays are topical formulations delivered as fine droplets through a suitable spray system.^[4] They allow rapid application over large or difficult-to-reach areas and can reduce the need for direct contact with the skin during application.^[6] Sprays may be formulated as solutions, suspensions, or emulsions depending on the ingredients and delivery system.^[6] Their convenient application makes them useful in certain skin-care and dermatological products.^[6] However, uniform distribution may depend on the spraying technique and the characteristics of the formulation.^[6]

8. Foams

Foams are topical preparations in which gas is dispersed within a liquid or semisolid formulation to produce a lightweight foam after application. They can spread readily over the

skin and may be particularly useful for hairy areas such as the scalp.^[1,6] Foams are generally perceived as less greasy and easier to apply than some conventional semisolid preparations.^[6] Their formulation requires appropriate propellant or foam-generating systems to produce and maintain the desired structure.^[6] However, foams may provide less occlusion and hydration than highly occlusive formulations such as ointments.^[1]

9. Emulgels

Emulgels are combined systems in which an emulsion is incorporated into a gel structure.^[3] They are designed to combine the advantages of emulsions and gels within a single topical formulation.^[3] The emulsion component can facilitate incorporation of both oil-soluble and water-soluble ingredients, while the gel network provides desirable consistency and spreadability.^[3] Emulgels can provide a less greasy sensory profile than conventional oily preparations and may be useful for cosmetic and dermatological applications.^[3] Their physical stability depends on appropriate selection of emulsifiers, gelling agents, and other formulation components.^[3]

10. Serums

Serums are generally lightweight skin-care formulations designed to deliver relatively concentrated cosmetic active ingredients to the skin.^[7] They may be formulated as aqueous systems, emulsions, gels, or other delivery systems depending on the nature of the active ingredients.^[7] Their relatively light texture and ease of application have contributed to their widespread use in modern facial skin-care products.^[7] Serums may contain ingredients intended for hydration, antioxidant protection, skin brightening, or other cosmetic purposes.^[7] The formulation approach is selected according to the stability, solubility, and desired delivery characteristics of the active ingredients.^[7]

The above formulations provide different physicochemical and sensory characteristics, allowing skin-care products to be designed according to the requirements of different skin types and application sites.^[1,2] Among these formulations, creams are particularly versatile because their emulsion-based structure can accommodate both aqueous and oily ingredients while providing moisturizing, emollient, and protective properties.^[1,3] Therefore, cream formulations provide a suitable basis for the development of multipurpose herbal skin-care preparations containing several plant-derived ingredients.^[3]

MULTIPURPOSE HERBAL CREAM

A multipurpose herbal cream is a topical semisolid preparation designed to incorporate multiple botanical or naturally derived ingredients with complementary skin-care functions.^[1,4] The term “multipurpose” refers to the incorporation of ingredients intended to provide several potential functions rather than a single cosmetic effect.^[1] Depending on its composition, such a formulation may provide moisturizing, emollient, antioxidant, conditioning and supportive antimicrobial properties.^[1,2]



COMMON METHOD OF PREPARATION

The preparation of a multipurpose herbal cream generally involves the preparation of separate oil and aqueous phases followed by their controlled emulsification to obtain a uniform semisolid preparation.^[1] The ingredients are first categorized according to their solubility and compatibility, with oil-soluble materials incorporated into the oil phase and water-soluble materials into the aqueous phase.^[1,2] In published cream formulations, the two phases are commonly heated separately to 60–75°C before emulsification, although the exact temperature depends on the composition of the formulation.^[1,2] The oil phase may contain ingredients such as beeswax, liquid paraffin and other lipophilic components, while the aqueous phase may contain purified water, glycerin and suitable water-soluble ingredients.^[1,3] The aqueous phase is then added gradually to the oil phase or vice versa under continuous stirring to form a stable emulsion.^[1,2] Continuous agitation is maintained during cooling until a smooth and homogeneous cream consistency is obtained.^[1,4] Heat-sensitive herbal extracts, fragrances and other temperature-sensitive ingredients are preferably incorporated during the cooling stage to minimize possible degradation.^[3] The finished cream is then transferred into

a suitable clean and well-closed container and stored under appropriate conditions until further evaluation.^[1,3]

Step-wise procedure

1. Selection and weighing of ingredients

All ingredients required for the formulation are accurately weighed according to the selected formulation composition.^[1]

2. Preparation of oil phase

Oil-soluble ingredients such as **beeswax and liquid paraffin** are transferred into a suitable vessel and heated in a water bath until the solid components melt and a uniform oil phase is obtained.^[2,5] Published formulations containing beeswax and mineral/liquid paraffin commonly use controlled heating around 65–75°C to obtain a homogeneous oil phase.^[2,5]

3. Preparation of aqueous phase

Water-soluble ingredients are dissolved or dispersed separately in purified water, and the aqueous phase is heated to approximately the same temperature as the oil phase.^[1,2]

Maintaining comparable temperatures between the two phases facilitates proper emulsification and helps reduce the risk of premature separation.^[2]

4. Emulsification

The heated aqueous phase is gradually incorporated into the oil phase with continuous stirring to form the cream emulsion.^[1,2] The rate of addition and intensity of agitation are controlled to obtain uniform distribution of the dispersed phase and prevent instability.^[2,3]

5. Incorporation of herbal ingredients

The selected herbal extracts or powders, such as neem, tulsi, turmeric, Aloe vera and papaya-derived ingredients, are incorporated according to their solubility, stability and heat sensitivity.^[1] Heat-sensitive botanical ingredients are preferably added after partial cooling of the cream to minimize exposure to excessive temperature.^[3]

6. Cooling and mixing

The emulsion is continuously stirred while it is allowed to cool gradually until a smooth and homogeneous semisolid cream is formed.^[1,4] Continued mixing during cooling helps maintain uniformity and contributes to the desired consistency of the final product.^[4]

7. Final incorporation

Any remaining heat-sensitive ingredients, fragrance or other suitable additives are incorporated during the lower-temperature stage, followed by gentle mixing until uniformity is achieved.^[3]

8. Final packaging and storage

The finished cream is transferred into clean, suitable and preferably well-closed containers after reaching room temperature.^[1,3] The prepared formulation is then stored under appropriate conditions and subjected to physicochemical, stability and other required evaluation tests.^[1,4]

COMMONLY USED INGREDIENTS

MATERIALS	DESCRIPTION
Neem 	Biological Name: <i>Azadirachta indica</i> Family: Meliaceae Constituents: It includes azadirachtin, nimbin, nimbidin, salannin, gedunin, meliantriol, nimbolide, quercetin, rutin, β-sitosterol, margosine, catechin, gallic acid, tannins, flavonoids, phenolic compounds, terpenoids, limonoids, oleic acid, linoleic acid, palmitic acid, and stearic acid. Uses: It is mainly used for its antimicrobial, anti-inflammatory, antioxidant, and anti-acne properties. It is commonly used in skin-care products, treatment of minor skin infections, acne, itching, and scalp conditions.
Tulsi 	Biological name: <i>Ocimum tenuiflorum</i> L. Family: Lamiaceae Constituents: Eugenol, ursolic acid, rosmarinic acid, linalool, methyl eugenol, and flavonoids. Uses: Mainly used for its antimicrobial, antioxidant, anti-inflammatory, and skin-soothing properties; commonly used in acne and minor skin infections and in herbal skin-care formulations.
Turmeric	Biological name: <i>Curcuma longa</i> L. Family: Zingiberaceae

	Constituents: Curcumin, demethoxycurcumin, bisdemethoxycurcumin, turmerone, atlantone, and zingiberone. Uses: Mainly used for its anti-inflammatory, antioxidant, antimicrobial, and wound-healing properties; commonly used in acne, skin irritation, and herbal skin-care formulations.
Aloe vera 	Biological name: <i>Aloe barbadensis</i> Mill. Family: Asphodelaceae Constituents: Aloin, aloe-emodin, acemannan, glucomannan, vitamins, amino acids, enzymes, and minerals. Uses: Mainly used for its moisturizing, soothing, anti-inflammatory, antioxidant, and wound-healing properties; commonly used in skin-care products, burns, acne, and irritated skin.
Papaya 	Biological name: <i>Carica papaya</i> L. Family: Caricaceae Constituents: Papain, chymopapain, carotenoids, vitamin C, flavonoids, phenolic compounds, and organic acids. Uses: Exfoliating, antioxidant, skin-brightening, antimicrobial, and wound-healing properties.
Beeswax 	Official/Pharmacopoeial names: <i>Cera alba</i> (white beeswax) / <i>Cera flava</i> (yellow beeswax) Source: Wax produced by honeybees (<i>Apis mellifera</i>) Constituents: Esters, fatty acids, hydrocarbons, alcohols, and free fatty acids. Uses: Mainly used as an emollient, thickening agent, stabilizer, and protective agent in creams and ointments.
Liquid Paraffin	Material: Liquid paraffin (mineral oil) Source: Purified petroleum-derived hydrocarbons Constituents: Mainly saturated hydrocarbons, particularly liquid alkanes.



Uses: Mainly used as an emollient, moisturizer, occlusive agent, and skin-conditioning agent in creams and ointments.

ROLE OF INGREDIENTS IN THE CREAM

Neem may contribute primarily through its reported antimicrobial and other biological activities.^[5] Tulsi may contribute antioxidant, antibacterial and anti-inflammatory potential associated with its phytochemical constituents.^[6,24] Turmeric may contribute antioxidant and anti-inflammatory activity associated particularly with curcuminoids.^[21,25] Aloe vera may contribute hydration, soothing and skin-supportive properties.^[7] Papaya-derived components may contribute skin-conditioning and enzymatic exfoliation potential.^[22,23] Beeswax can provide structure, consistency and protective occlusion, while liquid paraffin can contribute emollience and reduction of water loss.^[8,15]

EVALUATION OF MULTIPURPOSE HERBAL CREAM

Evaluation of a herbal cream is necessary to establish its physical quality, stability, safety and suitability for topical application.^[10] Published studies of herbal creams commonly evaluate organoleptic characteristics, homogeneity, pH, viscosity, spreadability, extrudability, phase separation, stability and microbial quality.^[10,29]

Appearance: The appearance of the cream is examined visually for uniformity, colour, gloss and visible defects. A satisfactory formulation should exhibit a consistent appearance without visible lumps, particles or phase separation.^[10]

Colour: It is evaluated visually or using an appropriate instrumental method to determine consistency between batches. Changes in colour during storage may indicate chemical degradation, oxidation or instability of botanical constituents.^[10]

Odour: The odour of the formulation is evaluated organoleptically to determine whether it is acceptable and characteristic of the formulation. Development of an unusual odour during storage may indicate degradation or microbial deterioration.^[10]

pH: The pH of the cream is measured using a calibrated pH meter or another validated method suitable for semisolid formulations.^[10,29] Determination of pH is important because highly unsuitable pH values may cause skin irritation and may also affect the stability of certain ingredients.^[10]

Spreadability: It describes the ease with which a cream can be distributed over the skin surface.^[10] Adequate spreadability is desirable because it facilitates uniform application and may improve user acceptability.^[10]

Viscosity: It represents the resistance of the formulation to flow and is an important parameter affecting cream consistency and application characteristics.^[10,20] Excessively high or low viscosity can affect spreading, filling, extrusion and consumer acceptability.^[10]

Phase Separation: It is evaluated to determine whether the emulsion remains physically stable during storage and stress testing.^[10] Separation of the aqueous and oily phases may indicate inadequate emulsification or instability of the formulation.^[10]

Washability: It evaluates how readily the cream can be removed from the skin using water or an appropriate cleansing procedure.^[10] Water-washability can influence the convenience and consumer acceptability of topical creams.^[10]

Stability: It evaluates whether the physical and chemical characteristics of the formulation remain within acceptable limits during storage.^[10] Parameters such as colour, odour, pH, viscosity, homogeneity and phase separation can be monitored during stability studies.^[10]

Microbial Evaluation: Microbial evaluation is important for creams containing water because microbial contamination can compromise product safety and stability.^[9,10] Appropriate microbiological testing should therefore be performed according to applicable standards and the intended use of the formulation.^[9]

ADVANTAGES

A multipurpose herbal cream can combine several skin-care functions within a single topical preparation.^[1,4] Combining botanical ingredients can provide access to different phytochemical profiles within one formulation.^[1,2] The formulation can also incorporate conventional excipients such as beeswax and liquid paraffin to improve consistency, emollience and occlusion.^[8,15] A single multifunctional product may also simplify the

application routine compared with using several separate topical preparations.^[1] However, the claimed benefits should be demonstrated through appropriate formulation testing and, where therapeutic claims are made, suitable experimental or clinical evidence.^[1,9]

LIMITATIONS

The composition of plant extracts can vary according to species, geographical origin, cultivation conditions, plant part and extraction method.^[1,2] Such variability can affect the reproducibility of biological activity and physical properties of the final product.^[1] Herbal formulations may also be susceptible to oxidation, degradation, microbial contamination and interactions between botanical constituents and excipients.^[1,9] Some natural ingredients can cause irritation or allergic reactions in susceptible individuals despite their natural origin.^[9] Therefore, standardization, quality control, stability testing and safety assessment remain important during development of herbal cosmetic formulations.^[1,9]

FUTURE PERSPECTIVES

Future development of herbal creams is likely to focus on improved standardization, characterization and quality control of botanical ingredients.^[1,2] Advanced delivery systems may be investigated to improve the stability, skin deposition and performance of poorly stable botanical constituents.^[2,25] Greater use of chemical markers and validated analytical methods may improve batch-to-batch reproducibility of herbal formulations.^[1] Well-designed clinical studies are also needed to distinguish experimentally demonstrated cosmetic benefits from traditional or theoretical claims.^[1,2] Sustainable sourcing and environmentally responsible extraction and manufacturing processes may further contribute to the development of naturally derived cosmetic products.^[1]

CONCLUSION

Multipurpose herbal creams represent a useful approach for combining several naturally derived skin-care ingredients within a single topical formulation.^[1,4] Botanicals such as neem, tulsi, turmeric, Aloe vera and papaya contain constituents that have been investigated for antimicrobial, antioxidant, anti-inflammatory, moisturizing, conditioning or exfoliating properties.^[5–7,21–23] Excipients such as beeswax and liquid paraffin can complement these botanical components by providing structural, emollient and occlusive functions.^[8,15] The successful development of a multipurpose herbal cream requires appropriate selection and compatibility of ingredients together with controlled preparation and systematic evaluation.^[9,10] Physicochemical, microbiological, stability and safety evaluation are necessary to

establish the quality and suitability of the final formulation.^[9,10] Further research involving standardized botanical materials and well-designed studies may help strengthen the scientific evidence supporting multifunctional herbal skin-care formulations.^[1,2]

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