



**INTERNATIONAL JOURNAL OF
PHARMACEUTICAL SCIENCES**
[ISSN: 0975-4725; CODEN(USA):IJPS00]
Journal Homepage: <https://www.ijpsjournal.com>



Review Article

Advancements In Herbal Skin Care Formulations: A Review

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ARTICLE INFO

Received: 21 March 2024

Accepted: 25 March 2024

Published: 27 March 2024

Keywords:

Herbal drug,
Nanoformulation,
Phytosomes, Liposomes,
Microemulsion.

DOI:

10.5281/zenodo.10887095

ABSTRACT

Due to their extensive therapeutic effects and lower adverse effects as compared to allopathic treatments, the use of herbal drugs has grown globally. The delivery of herbal medications in innovative formulations encounters obstacles because of the challenges involved in identifying, processing, standardizing, and extracting herbal medications to provide a regulated and prolonged release. Thanks to technological advancements, new herbal drug delivery systems with improved bioavailability, therapeutic impact, and lower toxicity can now be developed thanks to nanoformulations. Numerous innovative delivery systems, including phytosomes, liposomes, nanoparticles, microemulsions, etc., have been reported to successfully modify the distribution of a range of herbal medications. Compared to traditional distribution methods, nanoformulation offers a number of advantages, including improved absorption, increased bioavailability, and fewer adverse effects. The purpose of this review is to provide an overview of the herbal medicines used in the Uttarakhand region, with a focus on the innovative methods employed to enhance the safety and effectiveness of these herbs, as well as the kinds of active ingredients utilized in the development of herbal drug nanoformulations for dermal care that improve therapeutic response.

INTRODUCTION

Plants and their extractives are used to make herbal medications. An herbal formulation is a dosage form that contains one or more herbs, or processed herbs, in specific amounts to offer certain nutritional, cosmetic, and other health benefits. These formulations can also be used to change the physiology or structure of the body and aid in the diagnosis and treatment of various disorders. The evolution of drugs and contemporary medicine are

indicated by herbal medicine [1]. Herbal medicines are made by putting entire plants, scrap plants, and plant parts through processes like fractionation, distillation, expression, extraction, and purification. Herbal medicine has become a safe therapy option due to improvements in its analysis and quality control. It offers a safe and natural way to achieve healthy health. The majority of people on the planet use herbal products, especially in poorer nations [2]. Both

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Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



recognized and unregistered herbal enterprises and units abound in India. Over 70% of Indians continue to take non-allopathic medications. The cost of herbal remedies is significantly lower than that of prescription drugs. Prescription medication costs are often increased by marketing, testing, and research. Herbs can be purchased over-the-counter. You can grow simple herbs at home, such as peppermint, Ocimum, ginger, turmeric, coriander, etc. Due to their naturalness and safety, herbal medicines are becoming more and more popular.

Advantages

1. They cost less than allopathic medicaments.
2. They are good for more than one condition.
3. They have fewer side effects.
4. There are many choices on how to use them.
5. They do not require testing.

Disadvantages

1. Effects may be unpredictable.
2. Lack of regulation.
3. Takes longer time to show result.
4. If you are on medicine some can cause adverse effects.
5. Some herbs may have side effects.

The traditional drug delivery method utilized to give the patient the herbal medication has poor

pharmacological efficacy. For a very long time, the lack of scientific support and issues with standardization, extraction, and identification of specific medicinal components in intricate polyherbal systems prevented herbal medicines from being developed as innovative formulations. Modern herbal medicine research can address the scientific gaps in order to develop novel drug delivery systems, such as solid lipid nanoparticles, solid lipid microspheres, micro-emulsions, dermal and transdermal patches, solid dispersions, liposomes, phytosomes, ethosomes, and nanoparticles. These gaps include the determination of lethal dose, therapeutic dose, pharmacokinetics parameters, mechanism of action, site of action, and suitable route of administration.

Using plants to make herbal remedies

Herbal medicines have been made from plants and their derivatives since ancient times. Nearly every part of the plant is utilized, including the stem, roots, fruits, and leaves. Table 1 lists some of the herbs made from plants along with their sources and therapeutic use [3].

Table 1: Herbs with medicinal uses

Herbs	Local name	Part used	Medicinal uses
Citrus sinensis Linn	Malta	Fruit	Used in skin disease
Cannabis sativa	Bhang	Whole plant	Fever, diarrhea, skin disease, asthma and jaundice
Clematis barbellata Linn	Kangali	Leaf, roots	Skin disease
Datura innoxia Mill	Datura	Leaf, seeds & roots	Asthma, cough, veterinary disease
Amaranthus	Chaulai	Seeds, leaves	Used in ulcer, diarrhea
Citrus aurantiifolia	Kagji nimbu	Fruit	Improve complexion, liver detoxifier, flu & cold.
Syzygium cumini	Jamun	fruit	Improve Hb count, health of skin and eye
Trachyspermum ammi	Ajwain	seeds	Fight bacteria & fungi, lower BP, relieve indigestion
Zanthoxylum alatum	Timru	fruits	Used in toothache, fever, common cold, respiratory infection
Abrus precatorius	Rati, gunchi	Seed	Tuberculosis, painful swelling, angina pectoris, ulcer



Aegle marmelos	Bel	Fruit	Have antiulcer, anticancer, antimalarial prop- arty
Juglans regia	Akharot	leaves	Treatment of diarrhea, asthma, skin ailment etc.
Myrica esculenta	Kaphal	fruit	Cough, ulcer, inflammation, anemia, fever etc.
Agave Americana	Kamal cactus	Whole plant	Used as Antiseptic, wound-healing, anti-inflame- matory

Range of natural medications

Nutraceuticals

Nutraceuticals are dietary supplements that are naturally present in food and are thought to provide health or medicinal benefits [4]. Choline, calcium, and lycopene are a few examples. These days, researchers and experts are devoting a lot of time to understanding the connection between diet and illness prevention.

Therapy for skin conditions

Skin diseases are a frequent condition that can injure people in many different ways and affect people of all ages [5]. Although thousands of illnesses can affect the skin, the majority of skin diseases fall into one of the following main categories [6].

Rashes:

A rash is a skin alteration or a collection of distinct patches. The skin may turn red, change color, itch, get warm, chapped, dry, blistered, swell, or even hurt from a rash.

Viral Infection:

this happens when a virus enters the skin and spreads. Examples of viral infections are chickenpox, shingles, and warts, among others.

Infections caused by bacteria:

Staphylococci and streptococci are the most prevalent forms of bacteria that cause these infections. The outermost layers of skin, the follicles, or the deeper layers of skin can all become infected by bacteria. These infections have the potential to spread throughout the body if improperly managed. Lime disease, cellulites, and

severe folliculitis are a few examples. Antibiotics work better to treat bacterial illnesses.

Fungal infection:

Fungi that penetrate the skin can cause a fungal infection. Nails, skin, and hair may be impacted by this infection. Tinea corporis, pedis, and capitis are a few examples.

Infections caused by parasites:

These infections develop following contact with parasites like lice and scabies.

Pigmentation disorder:

Skin discoloration is the cause of this issue. The melanin is the cause of this. Pigmentation is the term for the darker or lighter blemishes on skin that occur when our bodies create too much or too little melanin.

Cancer and tumors:

These growths result from skin cells proliferating more quickly than usual. Not every growth on the skin is malignant. Certain cancers are benign and do not metastasize. Of all cancers, skin cancer is the most prevalent. The likelihood of a cure is increased with early discovery. Thus, it is advised to regularly examine oneself.

Miscellaneous:

There are other additional skin conditions, including warts, psoriasis, wrinkles, and scabies.

Certain botanicals for inflammatory skin conditions [7]

Many ailments that are stubborn and incurable in conventional medical systems can be rationally treated with herbal remedies. Compared to cosmetics based on chemicals, herbal remedies are safe and natural alternatives. Because they don't

contain any synthetic ingredients that could be detrimental to the skin, herbal formulations have always garnered a lot of attention. Antioxidants, vitamins, essential oils, tannins, alkaloids, dyes, carbohydrates, and terpenoids are among the bioactive compounds derived from plants that are utilized in cosmetics to treat the skin and other tissues of the body. Numerous plants have been studied for their potential to treat skin conditions, from skin cancer to irritation.

Alovera:

It works well for treating minor wounds, inflammatory skin conditions, and acne.

Neem:

Neem is used to treat psoriasis, ringworms, warts, acne, and eczema.

Bhringraj:

It's excellent for skin issues and general wellness. It shields skin from dullness and wrinkles. Additionally, it contains an anti-inflammatory quality that lessens dermatitis, psoriasis, and acne symptoms.

Sandalwood:

It reduces scar tissue and helps it repair. It possesses anti-aging qualities. Additionally, it avoids premature wrinkles and pimples.

Beetroot:

It has anti-aging qualities, it can cure acne and pimples as well as prevent symptoms of age.

Ganja:

the powdered leaves are used as a bandage for cuts and ulcers. Ganja is administered externally to treat itchy skin diseases and reduce pain. It helps with dermatitis, psoriasis, acne, and guards against bacterial, fungal, and viral infections.

Green tea:

It helps to repair aging skin cells, giving the appearance of youthful skin. It also stops skin tumors from starting to grow further within the body.

Carrots:

they prevent fine lines and slow down the aging process of the skin.

Tomato:

it helps with a number of skin issues, like uneven skin tone or aging indications. It could lessen sunburn and aid in skin removal.

Cosmetics

The newest thing in the health sector is cosmeceuticals. Cosmeceuticals, such as anti-wrinkle cream, are a novel class of goods that fall between medications and cosmetics that are designed to improve the health and appearance of skin [8].

Skincare products [9]

Different herbal active components are used in the formulation of herbal skin cosmetics, which are then added to a cosmetic base to nourish and treat a range of skin conditions. Herbal face wash, lip balm, herbal conditioners, herbal shampoo, herbal cream, and herbal soap are among the everyday use herbal cosmetics. Herbal-based cosmetics provide beneficial physiological effects, including appearance smoothing, healing, boosting, and conditioning qualities.

Vanishing cream:

An oil-in-water (o/w) emulsion, it is barely noticeable when applied to the skin. They have an emollient and moisturizing effect. Jojoba disappearing cream is one example.

Nourishing cream:

These non-greasy creams give skin protection and nourishment at the same time. Himalayan nourishing cream, for instance.

Cream for the night:

These creams are administered at night. They are made up of nutrients that revitalize the skin, moisturizers, and revitalisers. Night cream keeps the skin hydrated and stops evaporation. Himalayan rejuvenating night cream, for instance.

Moisturizer cream:

These creams are used on dry skin to keep the skin supple and to cure and mend dry skin. Aloe moisturizing cream, for instance.

Anti-acne cream: These lotions are applied to the skin's surface and primarily target sebaceous glands and hair follicles. Himalayan acne and pimple cream, for instance.

Sunscreen:

This is applied topically to shield skin from UV radiation damage. Ayur sunscreen is one type of herbal sunscreen.

Anti-wrinkle cream:

This type of cream is intended to minimize fine lines and postpone the appearance of wrinkles. Divya Tejas anti-wrinkle lotion is one example.

Fairness cream:

These creams lessen skin pigmentation and the production of melanin. Take Himalayan Fairness Cream, for instance.

Powdered herbs:

The market offers a variety of powders, including talc, dusting powder, body powder, after-bath and after-shave powders, and baby powder. There is a slight variation in the powder. As a result, both powders are seen as similar in certain ways.

Herbal face washes:

They are used to get rid of debris, dust, and other particles stuck to the skin on the face. Example: Aroma Magic Face Wash with Tea Tree and Neem.

Herbal face packs:

These concoctions are used on the face to promote blood flow in the facial area, tone muscles, leave the skin supple and elastic, and unclog pores by eliminating pollutants. Consider a face pack made of Himalayan neem.

Soaps made with herbs:

these are used to wash the body. The majority of fatty acids found in soaps are bound together by alkali metals. Triglycerides like tallow, coconut oil, and palm oil are the basic fatty acids utilized in soap manufacturing.

Nutracosmetics

They are a new category of health and beauty aids that enhance a cosmetic product's performance as well as its visual appeal. Herbs are a great source of antioxidants, anti-aging, hydrating, anti-cellulite, and antibacterial qualities. Herbal cosmetics are gentler, more biodegradable, and have a lower toxicity profile than synthetic cosmetics.

Novel pharmaceutical approaches

Traditional medications, such as creams, powders, etc., have a poor affinity for transdermal absorption through the skin. When it comes to cosmeceuticals, the typical cosmetic is not very effective. Herbal medicines have been used for centuries to treat illnesses since they have fewer negative effects and can have a potential impact. Researchers facing challenges in creating innovative herbal formulations include those related to the identification, processing, standardization, and extraction of herbal medications. Herbal medications delivered through conventional ways have decreased efficacy and limited affinity for transdermal absorption through the skin. These days, a variety of innovative drug delivery systems (NDDS) are used to reduce these issues, including phytosomes, ethosomes, transfersomes, herbal transdermal patches, nanoparticles, and biphasic emulsions. Herbal medicine's efficacy, effectiveness, efficiency, and safety will all enhance with its novel delivery method, as will the bioactive components' greater stability. These methods offer tailored action of plant extracts and actives, continuous release, and enhanced patient compliance. More potential exists for medications that are poorly soluble, poorly absorbed, and contain unstable herbal extracts or photochemicals, according to recent developments in nanotechnology. Newer ways that could improve a cosmetic product's performance as well as its appearance are being researched and

developed. Numerous strategies, including etc., are being researched in this regard (Figure 1) liposomes, phytosomes, transferosomes, [10]. nanoemulsions, nanoparticles, microemulsions,

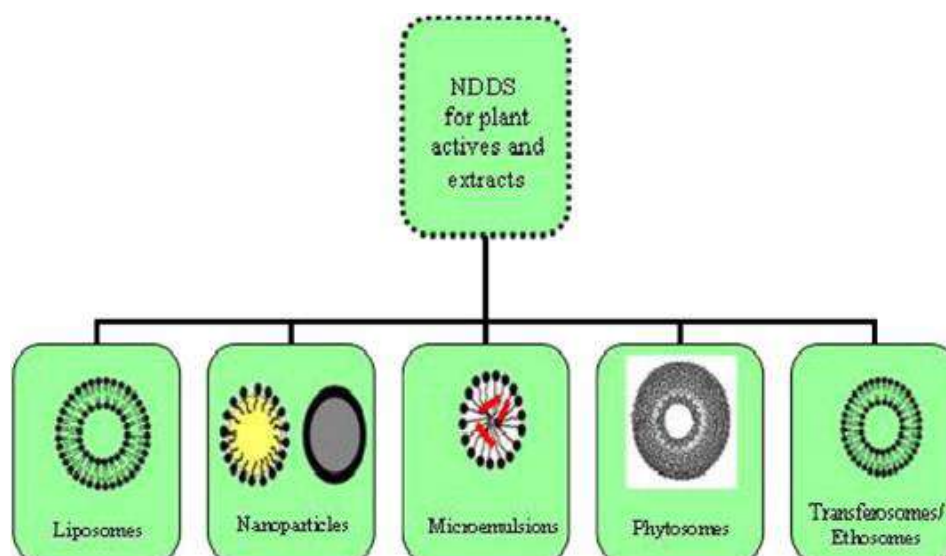


Figure 1: Novel pharmaceutical approaches

Advantages

- Enhanced specificity by drug targeting
- Providing high efficacy
- Enhanced stability
- Reduce undesirable effects and toxicity
- Better aesthetic appearance of products
- Long-term stability by protecting plant actives from degradation
- Decrease allergic potential of herbal substance
- Improved solubility & bioavailability
- Controlled drug delivery

Liposome

Liposomes are spherical vesicles made primarily of synthetic and natural phospholipids, with a completely lipid bilayer membrane enclosing the aqueous volume [11]. The broad appeal of liposomes can be attributed to their capacity to transfer both lipid- and water-soluble constituents, as well as their system's flexibility and vast range of possible uses.

Advantages

- The ability of ultra-deformable liposome to encapsulate active molecules and carry them through outer impenetrable carrier layer into the epidermis. This result in enhance efficacy and tolerability of these derma care products.
- Offer time - release mechanism.
- In derma care formulation they are used as delivering system, carrying active ingredients present in product to deeper layer of epidermis [12].

Phytosomes

Plants are referred to as "phyto," and "some" denotes a covering for a structure. Phytosomes are tiny entities that resemble cells. Generally, one or two moles of phospholipid and polyphenolic phytoconstituents are reacted to create a phytosome. It could be either 1:1 or 1:2 in ratio. Moreover, the use of phytosomes can lead to increased rates and extents of lipophilic herbal ingredients passing across lipid membranes, which explains the plant's ability to function as a carrier and preserve acid-labile herbal medications in the gastrointestinal system. Water-soluble phytoconstituents or standardized plant extracts

can be added to phospholipids using a recently discovered and patented process to create lipid-compatible molecular complexes [13]. The majority of phytomedicine's bioactive ingredients are substances that dissolve in water, such as glycosides and flavonoids. One important family of bioactive substances with a wide range of medicinal applications is flavonoids. When administered topically, the majority of plant flavonoids, such as silymarin and glycyrrhizic acid, have cosmetic benefits in addition to their therapeutic ones. Certain disorders, such as oedema, discomfort, inflammation, and fungal infections, can be treated locally by plant flavonoids.

Advantages of Phytosomes

- Enhances bioavailability of derma care products.
- Phytosomes are also superior to liposomes in the skin care product.
- They can be also used for enhanced permeation of product through skin for dermal delivery.

Transferosomes

Phospholipid-based sac-like vesicles called transferosomes have the potential to serve as medication delivery vehicles when applied topically. It gets past the barrier to penetration through the stratum corneum. It can easily pass through the skin's intracellular pores because of its elasticity. Transferosome-based delivery of colchicine offers prolonged, localized, and site-specific distribution while mitigating gastrointestinal side effects associated with oral dosing [15].

Advantages

- Transferosomes can deform and pass-through narrow constriction without measurable loss.
- They have high entrapment efficiency, in case of the lipophilic drug near to 90%. Easy to scale up, as the procedure is simple, do not involve lengthy procedure and unnecessary

use or pharmaceutically unacceptable additives.

- They slowly release their contents, thereby acting as a depot.

Nanoparticles

The size of nanoparticles ranges from 1 to 100 nm. Synthetic or semi-synthetic polymers with nano-or sub-nanoscale structural features make up nanoparticles. A particle is a tiny object that is used as a full unit with respect to its transit in nanotechnology. Because the formulation is readily encapsulated in the effective site, nanoparticles can readily access it. Herbal extract can be effectively protected from volatile losses, degradation, and interactions with other components by microencapsulating it in nanoparticulate form. The solubility, effectiveness, bioavailability, dose reduction, and enhanced absorption of herbal medications are only a few of the benefits that nanoparticles exhibit [16].

Advantages

- Nanoparticles improve the penetration of active constituents.
- Nanoparticles that are less than 100 nanometres in length are commonly used in sunscreen in form of micronized Zinc Oxide and Titanium Dioxide, to protect skin from UV rays.

Microemulsions

O/W type emulsions with a size of several microns are known as microemulsions. Because they are nontoxic and non-irritating, they are employed in veterinary medicine. Due to direct interaction with the tissues, the medication is packed in the inner phase and can release for an extended period of time [17].

Advantages

- It provides rapid penetration and active transport of active ingredients and hydration to skin.



- They are non-toxic and non-irritant, hence can be easily applied on skin and mucous membranes.
- They can be formulated in variety of formulations such as creams, foams, sprays etc.

CONCLUSION

The land of herbs and the birthplace of Ayurveda is India. In this review, a comprehensive list of herbs often found in the Indian state of Uttarakhand is compiled. Numerous therapeutic potentials of herbal medications should be examined through the use of cutting-edge drug delivery technologies. This review provides details on the development, necessity, and uses of innovative drug delivery systems in herbal medicine. Herbal medications have a wide range of medicinal uses. Thus, the use of new drug delivery methods to phytoconstituents can result in improved permeability, solubility, and bioavailability, which can lower the dosage and thus cause fewer negative effects. Many plant components that are added to innovative drug delivery systems in place of traditional extracts have shown improved therapeutic impact at doses that are comparable to or lower than those of the extracts. Therefore, the creation of a unique drug delivery method for herbal medications has a lot of promise and advantages.

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HOW TO CITE: Sanket Thombare, Amruta Bhigare, Advancements In Herbal Skin Care Formulations: A Review, *Int. J. of Pharm. Sci.*, 2024, Vol 2, Issue 3, 1125-1133. <https://doi.org/10.5281/zenodo.10887095>

