JOJ Dermatology & Cosmetics
ISSN: 2689-4610

Juniper Publishers
key to the Researchers

Review Article
Volume 4 Issue 2 -June 2021
DOI: 10.19080/JOJDC.2021.04.555631

JOJ Dermatol & Cosmet

A Review on Novel Pharmaceutical Approaches of Herbal Drugs in Derma Care

Sneha Bahuguna, Deepika Joshi*, Bhavana Singh and Nidhi Semwal

School of Pharmaceutical Sciences, SGRR University, Dehradun, 248001, India

Submission: June 01, 2021; **Published:** June 15, 2020

***Corresponding author:** Dr. Deepika Joshi, Assistant Professor, School of Pharmaceutical Sciences, SGRR University, Dehradun,248001, India

Abstract

The worldwide utilization of herbal drugs has increased due to their vast therapeutic effects and less side effects as compared to the allopathic medicines. Delivery of herbal drugs as novel formulations faces hurdles due to difficulties in identification, processing, standardizing, extracting of herbal drugs with an intention to accomplish sustained and controlled release. Now with the innovation in the technologies, nanoformulations paves pathway for the development of novel herbal drug delivery systems with enhancing bioavailability, therapeutic effect and reduced toxicity. Many novel carriers such as nanoparticles, phytosomes, liposomes, microemulsion, etc. have been reported for successful modified delivery of various herbal drugs. Nanoformulation shows various benefits conventional delivery approach such as enhanced absorption, bioavailability and reduction in side effect. The aim of this review is to summarize herbal medicament of Uttarakhand region emphasizing the various novel approaches used for improving safety and efficacy of such herbs, type of active ingredients used for developed nanoformulations of herbal drugs for dermal care to achieve better therapeutic response.

Keywords: Herbal drug; Nanoformulation; Nanoparticles; Phytosomes; Liposomes; Microemulsion

Introduction

Herbal medicaments are made from plants and their extractives. Herbal formulation refers to a dosage form consisting of one or more herbs or processed herbs in specified quantities to provide definite nutritional, cosmetic and other health benefits that are meant for diagnosis and treatment of diseases and to alter the structure or physiology. Herbal medicine is the sign of modern medicine and drug development [1]. Herbal medicaments are prepared by subjecting whole plant, scrappy plants, plants parts to treatments such as extraction, expression, distillation, fractionation and purification. With advancements in improvements with analysis and quality control of herbal medicine, it has been emerged as safe treatment option. As it is natural and safe it provides solution to good health. Most of the world population is using herbal products primarily in developing countries [2]. In India, there are many registered herbal industries as well as many unregistered herbal units. More than 70% of Indian population are still using non – allopathic medicaments. Herbal drugs is much less expensive than prescription medications. Research, testing, and marketing add significantly to the cost of prescribed medicines. Herbs are available without a prescription. Simple herbs, such as peppermint, Ocimum, ginger, turmeric, coriander, etc can be cultivated at home. Herbal medicaments are gaining much popularity as they are safe and natural.

Advantages

a. They cost less than allopathic medicaments.

b. They are good for more than one condition.

c. They have fewer side effects.

d. There are many choices on how to use them.

e. They do not require testing.

Disadvantage

a. Effects may be unpredictable.

b. Lack of regulation.

c. Takes longer time to show result.

d. If you are on medicine some can cause adverse effects.

e. Some herbs may have side effects.

Drug delivery system used for delivering the herbal drug to the patient is traditional, thus resulting in poor drug efficacy. For a long era herbal medicines were not considered for development as novel formulations owing to lack of scientific justification and processing problems, such as standardization, extraction and identification of individual drug components in complex polyherbal systems. Modern research in herbal medicament can solve the scientific needs (such as determination of lethal dose, therapeutic dose, pharmacokinetics parameters, mechanism of action, site of action, suitable route of administration etc.) for developing novel drug delivery system, such as solid lipid nanoparticles, solid lipid microspheres, micro-emulsions, dermal and transdermal patches, solid dispersions, liposomes, phytosomes, ethosomes and nanoparticles.

Plants as a source of herbal medication

Plant and their derivatives are used as a source of herbal drug since ancient time. Almost all parts of plant are used i.e. leaves, stem, bark, fruits and roots. Some of the herbs derived from plants with their sources [3] and medicinal uses are given in table 1. There are several Herbal production units in Uttarakhand region of India primarily in Haridwar, Kotdwar producing herbal and Ayurvedic product. Many general stores in Uttarakhand sell herbal medicaments. The government is also supporting the Ayurvedic manufacturing company to expand and grow their business (Table 1).

Table 1: Herbs with medicinal uses in Uttarakhand region.

Region	Herbs	Local name	Part used	Medicinal uses
Chamoli	Citrus sinensis Linn	Malta	Fruit	Used in skin disease
	Cannabis sativa	Bhang	Whole plant	Fever,diarrhea, skin disease, asthma and jaundice
	Clematis barbellats Linn	Kangali	Leaf, roots	Skin disease
	Datura innoxia Mill	Datura	Leaf, seeds &roots	Asthma, cough, veterinary disease etc.
Pauri	Amaranthus	Chaulai	Seeds, leaves	Used in ulcer, diarrhoea, swelling of mouth and throat
	Citrus aurantiifolia	Kagji nimbu	Fruit	Improve complexion, liver detoxifier, flu &cold.
	Syzygium cumin	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
Rudraprayag	Abrus precatorius	Rati , gunchi	Seed	Tuberculosis, painful swelling, angina pectoris, ulcer
	Aegle marmelos	Bel	Fruit	Have antiulcer, anticancer, antimalarial property
	Juglans regia	Akharot	leaves	Treatment of diarrhoea, asthma, skin ailment etc.
	Myrica esculenta	Kaphal	fruit	Cough, ulcer, inflammation, anaemia, fever etc
	Tinospora cordifolia	Giloe	stem	Has anti arthritic, anti-spasmodic, anti-allergic property
Almora	Agave Americana	Kamal cactus	Whole plant	Used as Antiseptic, wound-healing, anti-inflammatory
	Cassia absus	Chaksu	Seeds	Used in Skin disease like ringworm, renal stones etc
	Desmodium triflorum	Kudaliya n	Whole plant	anti-pyretic, antiseptic, skin problem, inducing sweat
	Mentha piperate	peppermint	Leaves	treat menstrual pain, nausea, muscle and nervw pain
Tehri	Acacia catechu Linn.	Khair	Bark	Used in diarrhea, dysentery,menstrual cramps
	Ficus religiosa	Peepal	Bark	Bronchitis and skin ailment
	Pinus roxburghii	Chir	Wood	Antiseptic, epilepsy, gonorrhea, asthma, foul ulcer
	Sapindus mukorossi	Reetha	Fruit	Used in dandruff and as a hair cleaner
	Morus alba	sahtoot	Fruit, root	Astringent, purgative

How to cite this article: Sneha B, Deepika J, Bhavana S, Nidhi S. A Review on Novel Pharmaceutical Approaches of Herbal Drugs in Derma Care. JOJ Dermatol & Cosmet. 2021; 4(2): 555631. DOI: 10.19080/JOJDC.2021.04.555631

Uttarkai	Aconitum heterophyllum	Atis	Roots	Used in diarrhea, fever, malaria, stomach disorder etc
	Tanacetum dolichophyllum	guggul	Gum	Anti-inflammatory, antiseptic, antispasmodic, liver tonic, given in weakness, diarrhea and fever
	ribulus terrestris	Gokhru	Seeds, leafs	Urinary compliance, sexual weakness, skin eruptions
	Withania somnifera	Ashvagandha	Roots	Boost immunity, helps in anxiety and stress, increase muscle strength, improve thyroid function.
Dehradn	Ageratum conyzoids Cassia occidentalis	Jangili pudina	Whole plant	Dysentery, diarrhea, use to cure wounds and burns
	Corchorus capsularis	Coffee senna	seeds	antifungal, ,antioxidant activity, used in skin infection
	Dioscorea bulbifera	White jute	leaves, roots	dysentery, as an aid to digestion, fever
	Euphobia hirta	Air patato Dudhi	bulb	Treatment of piles, syphills, cancer, asthma, leprosy. Used as antibacterial, antimalarial, antifertility, antiamoebic
Udhamsingh nagar	Acalypha indica	Kuppi	Roots, leafs	Used in skin problems, diabetes, eye infection
	Allium sativum	garlic	bulb	Antitumoral, CHF disease, regulate blood pressure
	Bombax ceiba	semal	Various parts	Treat skin, gynaecological and urogenital disease
	Cucumis sativus	cucumber	Fruit	Rash, blemished skin, diuretic, also smoothen skin
	Phyllanthus Emblica	Amla	Fruit	Hair care, eye care, blood purifier, treat anemia, diuretic
Pithoragarh	Bergenia ciliate	Pashanabheda	Whole plant	Kidney stone, GIT disorder, urinary troubles
	Berberis aristata	kilmora	Root	Fever, eye drop
	Geranium wallichianum	Chowri	Root	Dysentery, cold
	Quercus leucotrichophora	Banj oak	Wood	Used in scabies, skin disease
Bageshwar	Angelica galauca	Gandhrayan	Root	Used in bronchitis, stomach-ache, urinary disorder
	Bacopa monnieri	Brahmi	Leaf	Used in diarrhea, fever, cough, dysentery
	Bergenia ligulata	Silphora	Rhizome	Used in kidney stone, chronic cough and asthma
	Carum curvi	Jangli jeera	Seeds	Gastro and stomach-ache
	Leptodermis lanceolata	Padera	Leaf	Earache, headache
Champat	Cuscuta reflexa	Amarbel	Whole plant	Purgative, jaundice, muscle pain, cough, itchy skin
	Oxalis corniculata	chalmoda	Whole plant	Stomach disorder, wound healing, liver inflammation
	Plantago himalaica	Isabghol	Seeds	Used in diarrhea and various liver problem
	Thalictrum foliolosum	Mamiri	Root	Used in jaundice, snakebite, as purgative, diuretic
	Zanthoxylum armatum	timra	Seeds	Dried seed are used once a month for skin allergy
Nanital	Dioscorea bulbifera Duchesnea indica	Gethi	Bark, fruit	Piles, dysentria, syphilis, leprosy, cancer, cough
	Tagetes erecta	Genda	Leafs	Eye disease, used in ringworm and insect bite
	Urtica dioica	Bicchu ghas	Leafs , flower	Earache, treating bacterial infection, relieving pain
	Symplocos chinensis	Lodh	All parts Bark	Applied in body pain and external pains Leucoderma, backache, colds, fever, cough etc.

How to cite this article: Sneha B, Deepika J, Bhavana S, Nidhi S. A Review on Novel Pharmaceutical Approaches of Herbal Drugs in Derma Care. JOJ Dermatol & Cosmet. 2021; 4(2): 555631. DOI: 10.19080/JOJDC.2021.04.555631

Haridwr	Acacia concinna	Shikakai	Fruits	Hair problems, jaundice, skin disorder, constipation
	Justicia gendarussa	Kala bansa	Leaf/Roots	Asthma, chronic bronchitis, urinary tract infection
	Murraya koenigii	Kadi patta	Leaf	Heal wound and burn, losing weight, nausea,
	Terminalia arjuna	arjun	Bark	Used as antioxidant, antihypertensive, antimicrobial

Scope of herbal medicaments

Nutraceuticals

Nutraceuticals are oral dietary components naturally found in foods and believed to have a medical or health benefit [4]. Some examples are lycopene, choline, calcium etc. Nowadays, scientists and scholars are giving great attention in discovering the relation between nutrients and disease prevention. Data has been tabulated in Table 2. Most of the herbs used since ages have proved to be useful in prevention and treatment of disease.

Table 2: Herbs with health benefits.

S.no	Herbs	Biological source	Medicinal uses
1	Garlic	It consists of the fresh compound bulb of *Allium sativum Linn.* (Family Lilliaceae).	Anti-inflammatory, ant gout, nervine tonic, antibacterial etc.
2	Turmeric	Obtained from dried rhizomes of *Curcuma longa Linn.* (Family Zingiberaceae).	Aromatic, anti-inflammatory, blood purifier, tonic, menstrual pains, liver disease etc.
3	Senna	It consists of dried leaflets of *Cassia angustifolia Vahl* (Family Leguminosae).	Purgative, weight loss etc.
4	Liquorice	Liquorice is the dried, peeled or unpeeled, roots, rhizomes or stolen of *Glycyrrhiza glabra Linn.* (Family Leguminosae).	Anti-inflammatory, antiulcer, in treatment of Addison's disease, also used in preparation of cough lozenges etc.
5	Ginger	It consists of the rhizomes of *Zingier officinalis* (Family Zingiberaceae).	Morning sickness, nausea, vomiting, stimulant, throat infection etc.

Treatment of skin disease

Skin disease is common ailment and it affects all ages and cause harms in number of ways [5]. There are thousands of conditions that may affect skin but most skin disease can be categorised into following common types [6].

i. **Rashes**: A rash is changed of skin or group of individual spots. Rashes may be caused the skin to change the colour, itch, becomes warm, chapped, dry, cracked or blistered, swell or may be painful.

ii. **Viral Infection**: this occurs when virus penetrates and infects skin. Some of example of viral infection includes shingles, warts, chickenpox etc.

iii. **Bacterial infections**: These infections are caused by a variety of bacteria, the most common types being staphylococci and streptococci. Bacteria may infect the topmost layers of skin, the follicles, or the deeper layers of skin. If not treated correctly, these infections may spread throughout the body. Examples include impel folliculitis, cellulites and lime disease. Bacterial infections are better treated with antibiotics

iv. **Fungal infection**: this infection occurs when fungi enters skin. This infection can affect nails, skin and hair. Example includes tinea capitis, tinea pedis, tinea corporis etc.

v. **Parasitic infections**: These infections occur after exposure to parasites such as lice and scabies.

vi. **Pigmentation disorder**: This problem occur due to discolouration of skin. This occurs due to melanin. When our body produce too much or too less melanin that result in darker or lighter marks on skin known as pigmentation.

How to cite this article: Sneha B, Deepika J, Bhavana S, Nidhi S. A Review on Novel Pharmaceutical Approaches of Herbal Drugs in Derma Care. JOJ Dermatol & Cosmet. 2021; 4(2): 555631. DOI: 10.19080/JOJDC.2021.04.555631

vii. **Tumours and cancer**: These growths arise when skin cells begin to multiply faster than normal. Not every skin growth is cancerous. Some tumors are harmless and will not spread. Skin cancer is the most common of all the cancers. Early detection helps to improve the chances of a cure. Regular self-examinations are, therefore, recommended.

viii. **Skin Trauma**: This is an injury of skin caused by stretching, cut, scraping, tearing, burn etc.

ix. **Miscellaneous**: Many other skin problems are also there such as wrinkles, scabies, psoriasis, warts etc.

Some herbs for skin disease [7]

Herbal medicines provide rational means for the treatment of many diseases that are obstinate and incurable in other systems of medicine. Herbal cosmetics are natural and are found to be safe to use as compared to chemical-based cosmetics. Herbal formulations have always attracted considerable attention because they are free from all the harmful synthetic chemicals which otherwise may prove to be toxic to the skin. The bioactive ingredients from plants include antioxidants, vitamins, essential oils, tannins, alkaloids, dyes, carbohydrates, and terpenoids, which are used as cosmetics for care of skin, body, and it's other parts. Several plants have been investigated for treatment of skin diseases ranging from itching to skin cancer.

i. **Alovera**: It is effective in acne treatment, inflammatory skin disorder and minor wounds.

ii. **Neem**: Neem has been used to treat acne, warts, ringworms, eczema and psoriasis.

iii. **Bhringraj**: It is great for skin health and problem. It prevents wrinkles and dull skin. It also has an anti-inflammatory property that helps to reduce symptoms of acne, psoriasis and dermatitis.

iv. **Sandalwood**: It heals and fades scar tissue. It has anti-ageing properties. It also prevents pimples and premature lines.

v. **Beetroot**: they have anti-aging properties thus prevent signs of aging, and fight against pimples and acne.

vi. **Marigold**: flower are commonly used for wounds, rashes, infection, warts, pimples, wrinkles and many other skin conditions.

vii. **Ganja:** the powder of leaves serves as a dressing for wounds and sores. Ganja is externally applied to relieve pain in itchy skin disease. It is useful for skin disease like dermatitis, psoriasis, acne and prevents from viral, bacterial and fungal infection.

viii. **Green Tea**: They rejuvenate the old skin cells and thus make skin look younger. It also prevent onset of further growth of skin tumor in body.

ix. **Carrot**: they help in reducing skin aging process, wrinkles and prevent fine lines.

x. **Tomato**: it provides benefits for various skin concerns such as uneven skin tone or signs of aging. It may reduce sunburn and help in removing dead skin.

Cosmeceuticals

Cosmeceuticals are the latest addition to the health industry. Cosmeceuticals represent a new category of products placed between cosmetics and pharmaceuticals that are intended for the enhancement of both the health and beauty of skin e.g. anti-wrinkle cream [8].

a. **Skin care products** [9]

Herbal skin cosmetics are formulated using different herbal active ingredients, which are further incorporated in cosmetic base to nourish and cure various skin ailments. The herbal cosmetics which are used on a daily basis include herbal cream, face wash, lip balm, herbal conditioners, herbal soap, and herbal shampoo. Cosmetics based on herbal ingredients possess desirable physiological activity such as smoothing appearance, healing, enhancing, and conditioning properties.

i. **Herbal cream:** The key ingredient in the formulation of herbal creams is plants derivatives. Following are type of Herbal creams:-

ii. **Vanishing cream:** These are oil-in-water emulsion (o/w), and are hardly visible when applied to skin. They impart moisturizing as well as emollient effect. Example - jojoba vanishing cream.

iii. **Nourishing cream:** These creams are non-greasy, and provide nourishment as well as protection to skin. Example: - Himalayan nourishing cream.

iv. **Night cream:** These creams are applied during night. They consist of revitalisers, moisturisers and skin rejuvenating nutrients. Night cream prevent evaporation and moisturize the skin. Example – Himalayan revitalizing night cream.

v. **Moisturizer cream:** These creams are applied on dry skin as well as they heal and repair dry skin and maintain the softness of skin. Example – aloe moisturizing cream.

vi. **Anti-acne cream:** These creams are applied on skin surface and mainly act on hair follicles and sebaceous glands. Example – Himalayan acne and pimple cream.

vii. **Sunscreen:** These are used topically to protect skin from harmful effects of sunrays. One such herbal sunscreen is Ayur sunscreen.

viii. **Anti-wrinkle cream:** These creams are used for delaying wrinkles and reducing the fine lines. Example - Divya Tejas anti-wrinkle cream.

How to cite this article: Sneha B, Deepika J, Bhavana S, Nidhi S. A Review on Novel Pharmaceutical Approaches of Herbal Drugs in Derma Care. JOJ Dermatol & Cosmet. 2021; 4(2): 555631. DOI: 10.19080/JOJDC.2021.04.555631

ix. **Fairness cream:** These creams reduces melanin formation as well as skin pigmentation. For example Himalayan fairness cream.

x. **Herbal powders:** A range of powders are available in the market such as dusting powder, talcum powder, body powder, after-bath powder after-shave powder and baby powder. A minor difference exist amongst the powder. Therefore, these powders are considered same to some extent.

xi. **Herbal face wash:** These are used to remove dirt, dust and other debris adhered to facial skin. Example Aroma magic neem and tea tree face wash.

xii. **Herbal face pack:** These formulations are applied on face to stimulate blood circulation in facial region, provide muscle toning, make the facial skin supple and elastic, and clean clogged skin pores by removing impurities. For example Himalayan neem face pack.

xiii. **Herbal lip balm:** These are used in lips to prevent them from cracking, chapping and drying. Edible ingredients are used in the formulation of lip balm. They also contain ingredient that act as natural filter to UV rays and Vitamin E to provide nourishment and softness.

xiv. **Herbal soaps:** these are used for cleansing the body. Soaps are generally made up of a mixture of fatty acids sequestered by alkali metals. The basic fatty acids used in formulation of soaps are triglycerides such as tallow, coconut oil and palm oil.

b. Herbal hair product [10]

They are used for dressing and nourishing the hair and grace to appearance of hairs. This preparation is generally used to increase the growth of hair and to make hair healthy. Some hair products include hair oil, hair shampoos, hair conditioner, hair colorants etc.

c. Herbal tooth preparation

They are used to control and prevent teeth disorder that includes herbal toothpastes, herbal mouthwash, herbal dentifrice etc.

Nutracosmetics

They are an emerging class of health and beauty aid products that improve both the aesthetic appeal and performance of a cosmetic product. Herbs have many beneficial properties, such as sunscreen, antiaging, moisturizing, antioxidant, anticellulite, and antimicrobial effects. As compared with synthetic cosmetic products, herbal products are mild, biodegradable, and have low toxicity profile.

Novel pharmaceutical approaches

Conventional medicaments such as powders, cream etc have low affinity to skin transdermal absorption. The standard cosmetic shows little efficiency as cosmeceuticals. Since ancient times, herbal medicament are used to cure the ailments due to their potential effect and less side effects. Identification, processing, standardizing and extracting of herbal drugs poses hurdles for researchers for developing novel formulation of herbs. Traditional methods of herbs delivery shows reduced efficacy and low affinity to skin transdermal absorption of herbal drugs. To minimize these problems various novel drug delivery systems (NDDS) such as phytosomes, ethosomes, transfersomes, herbal transdermal patches, nanoparticles and biphasic emulsions are used nowadays. Novel approach of delivering herbal drugs will increase the efficacy, effectiveness, efficiency and safety of herbal medicines along with the increased stability of the bioactive agents. These techniques provide improved patient compliance, sustained release and targeted action of plant actives and extracts. Recent advances in nanotechnology shows greater prospective for medicaments that are poorly soluble, poorly absorbed and has unstable herbal extracts or photochemical. Research is being done in the development of newer approaches that could enhance both the visual appearance and performance of a cosmetic product. In this respect, various approaches are studied such as liposomes, phytosomes, transferosomes, nanoemulsions, nanoparticles, microemulsions, etc.

Advantages for designed herbal medicaments with novel drug delivery systems such as

i. Enhanced specificity by drug targeting

ii. Providing high efficacy

iii. Enhanced stability

iv. Reduce undesirable effects and toxicity

v. Better aesthetic appearance of products

vi. Long-term stability by protecting plant actives from degradation

vii. Decrease allergic potential of herbal substance

viii. Improved solubility & bioavailability

ix. Controlled drug delivery

Liposome

Liposomes are spherical shaped vesicles in which aqueous volume is entirely enclosed by a lipid bilayer membrane mainly consist of natural and synthetic phospholipids [11]. The wide popularity of liposome has been due to the ability to transport both water and lipid soluble components to the flexibility of the system and large variety of potential application (Figure 1).

a. Advantages of liposome: [12]

i. The ability of ultra-deformable liposome to encapsulate active molecules and carry them through outer impenetrable

How to cite this article: Sneha B, Deepika J, Bhavana S, Nidhi S. A Review on Novel Pharmaceutical Approaches of Herbal Drugs in Derma Care. JOJ Dermatol & Cosmet. 2021; 4(2): 555631. DOI: 10.19080/JOJDC.2021.04.555631

carrier layer into the epidermis. This result in enhance efficacy and tolerability of these derma care products.

ii. Offer time - release mechanism.

iii. In derma care formulation they are used as delivering system, carrying active ingredients present in product to deeper layer of epidermis.

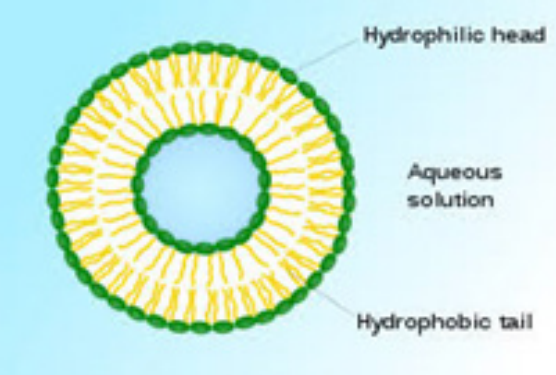

Figure 1: Structure of Liposome.

Phytosomes

"Phyto" means plants and "some" resembles a covering around/or a structure. Phytosomes are little cell-like structures. Phytosome is generally prepared by reacting one or two moles of polyphenolic phytoconstituents and phospholipid. It may be either in the ratio of 1:1 and 1:2. By using phytosomes, one can also achieve enhanced rate and extent of the passage of lipophilic herbal constituents across lipid membrane that explains its character as a carrier as well as acid labile herbal drugs could also be protected in gastrointestinal tract. It is a newly developed and patented technology to incorporate water-soluble phytoconstituents or standardized plant extracts into phospholipids to generate lipid compatible molecular complexes [13]. Most of the bioactive constituents of phytomedicine are water soluble compounds e.g., flavonoid, glycosides etc. Flavonoids are a major class of bioactive compounds possesses broad therapeutic activities. Most of the plant flavonoids i.e., glycyrrhizic acid, silymarin also having cosmetic value apart from their medicinal value, when applied topically. Plant flavonoids have local action on some diseases like inflammation, oedema, pain, fungal infections etc (Figure 2).

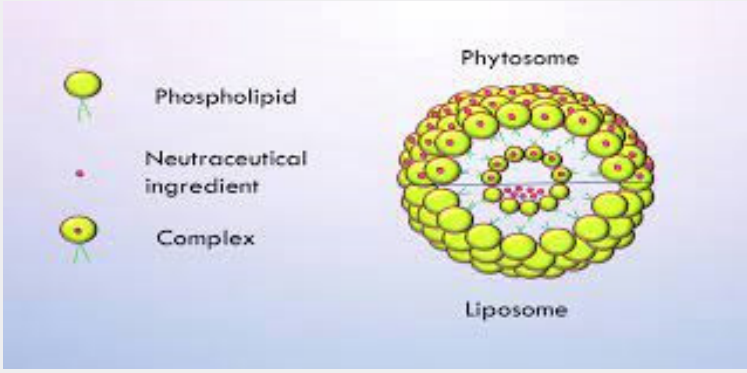

Figure 2: Structure of Phytosome.

a. Advantages of Phytosomes

i. Enhances bioavailability of derma care products.

ii. Phytosomes are also superior to liposomes in the skin care product.

iii. They can be also used for enhanced permeation of product through skin for dermal delivery.

Transferosomes

Transferosomes are sac-like vesicle composed of phospholipids that acts as potential carriers for the delivery of the drug through

How to cite this article: Sneha B, Deepika J, Bhavana S, Nidhi S. A Review on Novel Pharmaceutical Approaches of Herbal Drugs in Derma Care. JOJ Dermatol & Cosmet. 2021; 4(2): 555631. DOI: 10.19080/JOJDC.2021.04.555631

transdermal route. It overcomes the penetration difficulty through the stratum corneum. Due to their flexibility, it can easily penetrate through the intracellular pores of the skin. Colchicine delivery through transferosomes provides sustained, local and site-specific delivery and preventing it from the gastrointestinal side effects due to oral administration [14] (Figure 3).

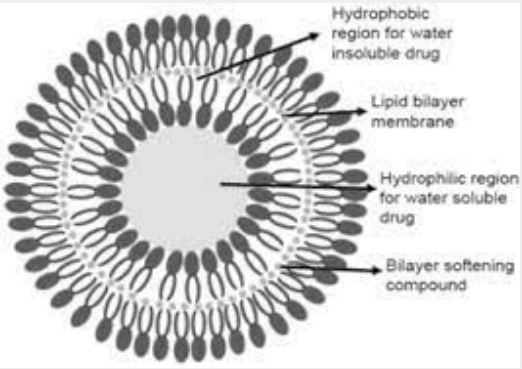

Figure 3: Structure of transferosomes.

a. Advantages of Transferosomes

i. Transferosomes can deform and pass through narrow constriction without measurable loss.

ii. 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.

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

Ethosomes

Ethosomes are a sac-like system composed of a high concentration of ethanol and phospholipids [15]. Ethosomes were reported to be effective at delivering molecules to and through skin to systemic circulation (Figure 4).

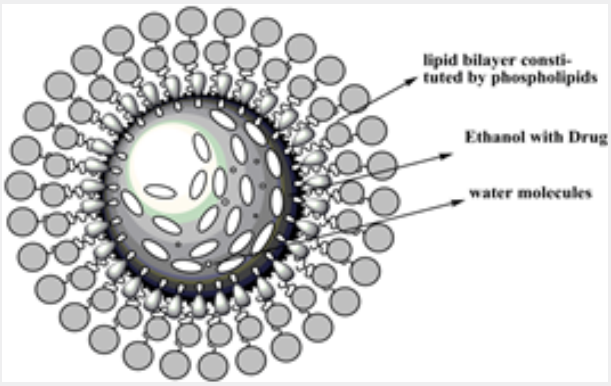

Figure 4: Structure of Ethosomes.

a. Advantages of Ethosomes

i. It increases the transdermal and dermal permeability of drug through the skin.

ii. It can entrap all types of drug molecules i.e. hydrophilic, lipophilic or amphiphilic.

iii. Ethosomal systems are much more efficient at delivering a fluorescent probe to the skin in terms of quantity and depth.

Nanoparticles

Nanoparticles have a particle size in between 1- 100 nm. Nanoparticles are composed of synthetic or semi synthetic polymers having nano or sub nano-sized structures. In

How to cite this article: Sneha B, Deepika J, Bhavana S, Nidhi S. A Review on Novel Pharmaceutical Approaches of Herbal Drugs in Derma Care. JOJ Dermatol & Cosmet. 2021; 4(2): 555631. DOI: 10.19080/JOJDC.2021.04.555631

nanotechnology, a small object that used as a whole unit with respect to its transport is defined as particle. Nanoparticles can easily reach the effective site as the formulation is encapsulated in it easily. Microencapsulation of herbal extract in nanoparticulate is an effective way used to protect drug from volatile losses, deterioration, or interaction with other ingredients. Nanoparticles show several advantages like solubility enhancement, efficacy enhancement, bioavailability enhancement, dose reduction and improved absorption of herbal medicines [16].

a. Advantages of herbal nanoparticles delivery system

i. Nanoparticles improve the penetration of active constituents.

ii. 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

Microemulsions are O/W type emulsion having the size of several microns. They are used for the veterinary purpose for being nontoxic and non-irritant in nature. The drug is packed in the inner phase and can release for a long time because of direct contact with the tissues [17] (Figure 5).

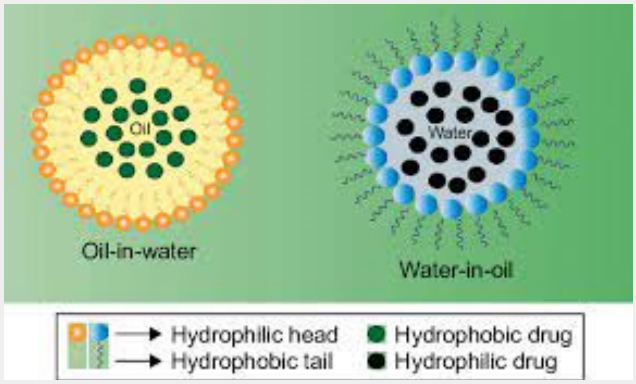

Figure 5: Structure of microemulsions.

a. **Advantage of microemulsions**

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

ii. They are non-toxic and non-irritant, hence can be easily applied on skin and mucous membranes.

iii. They can be formulated in variety of formulations such as creams, foams, sprays etc.

Research Findings for Role of Herbs in Derma Care

Rane RB et al [18] discussed Herbal medications have restorative potential, which can be given through different advantageous medication conveyance frameworks. Utilizing the bioactive and plant extricates, the assortment of novel natural details like polymeric nanoparticles, liposomes, phytosomes, nanoemulsions, microsphere, transfersomes, and ethosomes are accounted for [18]. Kumar Sudhir et al [19] discussed Phytochemicals are healing the world from millions and billions of years even though their clinical validation is questioned by virtue of their implements like low lipid solubility, poor solubility, large size moiety and needless metabolism in gut. Phytosome technology has emerged as commited and promising targeting novel drug delivery with improve efficacy, quality and target ability of active plant constituents. Novel herbal formulation techniques have assured the researchers to deliver the plant based secondary metabolites to their systemic targets [19]. Arora Riya et al [20] reviewed the herbal cosmetics and safety profile as compared to chemical-based cosmetics. Cosmetics based on herbal ingredients possess desirable physiological activity such as smoothing appearance, healing, enhancing, and conditioning properties [20]. Pal Saxena Rashmi et al [21] discussed the possibilities of developing new anti-aging cosmeceuticals with natural ingredients for topical applications. Such cosmetics shows multifunctional benefits in the area of anti-oxidant cellular protection and skin health with anti-inflammatory and anti-stress properties [21]. Afrin S et al [22] described various novel drug delivery systems (NDDS) such as phytosomes, ethosomes, transfersomes, herbal transdermal patches, nanoparticles and biphasic emulsions for delivery herbal drugs. Novel approach of delivering herbal drugs will increase the efficacy and safety of herbal medicines along with the increased stability of the drug product. These techniques provide improved patient compliance, sustained release and targeted action of plant actives and extracts [22]. Yapar EA [23] described herbal cosmetics and critical parameters that affects the final quality and stability of herbal cosmetics are the specifications of herbal inputs, structure of formulation and manufacturing process [23].

Kumar Arun et al [24] discussed the poor oral bioavailability of polyphenolic compound can be enhanced through the

How to cite this article: Sneha B, Deepika J, Bhavana S, Nidhi S. A Review on Novel Pharmaceutical Approaches of Herbal Drugs in Derma Care. JOJ Dermatol & Cosmet. 2021; 4(2): 555631. DOI: 10.19080/JOJDC.2021.04.555631

incorporation of them into phospholipid based self-assembled delivery system, i.e. popularly known as phytosome. There are number of products available in the market that contains phytosomal drug delivery system such as Ginkgo biloba, Silybum marianum, and Camellia sinensis [24]. Sharma Parth et al [25] discussed recent advancement in the uses of plant therapeutics, on development of novel herbal formulations like polymeric nanoparticles, nanocapsules, liposomes, phytosomes, nanoemulsions, microsphere, transferosomes and ethosomes etc. Nanoformulations shows drug targeting properties with improved selectivity, drug delivery and effectiveness with dose reduction which not only increase the safety but also patient compliance [25]. Bozzuto Giusepinna and Molinari Agnese [26,27] analyzed efficacy of liposomes depending on the nature of their components and their size, surface charge, and lipidic organization. Further, discussed the influence of the physicochemical properties of liposomes on their interaction with cells, half-life, ability to enter tissues, and final fate in vivo [26].

Singh Rawat Manju et al [27] discussed innovation in the technology for novel drug delivery systems in the direction of the development of herbal drug delivery systems with enhancing bioavailability, therapeutic effect and reduced toxicity. Many novel carriers such as nanoparticles, phytosomes, liposomes, transferosomes, etc. have been reported for successful modified delivery of various herbal drugs e.g. tacrolimus, quercetin, silybin, ginkgo, ginseng, Berberine etc [27]. Thakur L et al [28] discussed problems associated with conventional herbal medicaments and need to develop novel formulations for herbal moieties [28]. Chanchal D et al [29] studied and discussed various approaches such as liposomes, phytosomes, transferosomes, nanoemulsions, nanoparticles, microemulsions, nanocrystals, and cubosomes for delivering nutracosmetics [29]. Gupta Amit et al [30] discussed phytosomes are newly introduced structure, which contains the bioactive phytoconstituents of herb surrounds and bound by lipid. Phytosomes are probably a system which can improve absorption of phytoconstituents through skin, to regulate the physiology of skin compositions [30].

Conclusion

India is a land of herbs and origin place of Ayurveda. An exhaustive collection of herbs prevalent in Uttarakhand state of India has been summarized in present review. Herbal drugs contain a lot of therapeutic potentials that should be analysed using application of novel drug delivery technology. This review gives information about advancement, need and applications of novel drug delivery system in herbal medicine. Herbal drugs have plenty of therapeutic potential. Therefore applications of novel drug delivery systems to phytoconstituents can lead to enhanced bioavailability, increased solubility and permeability, thereby reducing the dose and hence, side effects. Number of plant constituents have exhibited enhanced therapeutic effect at similar or less dose when incorporated into novel drug delivery systems as conventional extracts. Hence, there is great potential and benefits in development of novel drug delivery system for herbal drugs.

Acknowledgment

All authors have contributed significantly in the preparation of the manuscript and are in agreement with the content of the manuscript and agree to submission to JOJ Dermatology & Cosmetics. The authors express gratitude to School of Pharmaceutical Sciences, SGRRU, Dehradun, India.

References

1. Da Yong L, Ting RL (2019) Herbal medicine in new era. Hospice & Palliative Medicine International Journal (4): 125-130.
2. Mahady BG (2001) Global Harmonization of Herbal Health Claims. The Journal of Nutrition 131(3): 1126S-1123S.
3. Dwivedi T, Kanta C (2019) A list of some important medicinal uses from Himalayan state Uttarakhand, India. Journal of medicinal plants studies 7(2): 106-116.
4. Chauhan B, Kumar G, Kalam N, Ansari SH (2013) Current concepts and prospects of herbal nutraceutical: a review. J Adv Pharm Technol Res 4(1): 4-8.
5. Marks JG, Miller J (2006) Lookingbill and Marks Principles of Dermatology 4th ed, Elsevier Inc.
6. Tabassum N, Hamdani M (2014) Plant used to treat skin disease. Pharmacogn Rev 8(15): 52-60.
7. Gupta A, Jana G (2010) Herbal Treatment to Skin Disease: A Global Approach. Drug Invention Today 2(8): 381-384.
8. Martin LK, Glaser AD (2011) Cosmeceutical: The New Medicine of Beauty. The Journal of Missouri State Medical Association 108(1): 60-63.
9. Rakesh KS, Arora R (2006) Plant for aromatherapy and cosmetics in herbal drug (Ist edition), Jaypee Publication, New Delhi, India, pp. 469-475.
10. Saudagar RB, Sisodiya HM (2018) Review on Herbal Cosmetics. World Journal of Pharmaceutical Research 7(7): 573-591.
11. Karim N, Moghimipour E, Salimi A (2018) Liposomes as a Novel Drug Delivery System. Asian General of Pharmaceutics 12(1): S31-S41.
12. Kulkarni TG (2011) Herbal Drug Delivery Systems: An Emerging Area in Herbal Drug Research. Journal of Chronotherapy and Drug Delivery 2(3): 113-119.
13. Jain N, Gupta PB, Thakur N, Jain R, Banweer J, Jain KD, Jain S (2010) Phytosome: A Novel Drug Delivery System for Herbal Medicine. International Journal of Pharmaceutical Sciences and Drug Research 2(4): 224-228.
14. Kumavat DS, Chaudhary SY, Borole P, Duvveri P, Bubera N, et al. (2013) Transfersomes: A Promising Approach For Transdermal Drug Delivery System. Asian Journal of Pharmaceutical Sciences and Research 3(5): 1-17.
15. Pathak K, Verma P (2010) Therapeutic and cosmeceutical potential of ethosomes: An overview, Journal of Advanced Pharmaceutical Technology and Research 1(3): 274-282.
16. Jeevanandam J, Barhoum A, Chan SY, Dufresne A, Danquah KM (2010) Review on nanoparticles and nanostructured materials: history, sources, toxicity and regulations. Beilstein Journal of Nanotechnology 9: 1050-1074.

How to cite this article: Sneha B, Deepika J, Bhavana S, Nidhi S. A Review on Novel Pharmaceutical Approaches of Herbal Drugs in Derma Care. JOJ Dermatol & Cosmet. 2021; 4(2): 555631. DOI: 10.19080/JOJDC.2021.04.555631

17. Mazurka HN, Wahab AR, Hamid AM (2019) An overview of nanoemulsion: concepts of development and cosmeceutical applications. Biotechnol Biotechnol Equip 33(1): 779-797.

18. Rane RB, Patil KA, Kesarvani KR, Jain SA (2021) Enhancing Therapeutic Efficacy of Herbal Formulations. IGI Global Publishers, p. 43-68.

19. Kumar S, Baldi A, Sharma DK (2020) Phytosomes: A Modernistic Approach for Novel Herbal Drug Delivery. Journal of Developing Drugs 9(2): 1-8.

20. Arora R, Aggarwal G, Dhingra AG, Nagpal M (2019) Herbal Actives for Skin. Asian Journal of Pharmaceutical and Clinical Research 12(9): 7-15.

21. Saxena R, Pal Y, Saraswat N, Wal P, Wal A (2019) Current Review on Herbs for Derma Care. The Open Dermatology Journal 13(1): 41-46.

22. Afrin S, Jahan I, Hasan N, Kanij ND (2018) Novel Approaches of Herbal Drug Delivery. Journal of Pharmaceutical Research International 21(5): 1-11.

23. Yapar EA (2017) Herbal Cosmetics and Novel Drug Delivery Systems. Indian Journal of Pharmaceutical Education and Research 51(3): S152-S158.

24. Kumar A, Kumar H, Singh KS, Kaur B, Singh S (2017) A Review on Phytosomes: Novel Approach for Herbal Phytoconsituents. Asian Journal of Pharmaceutical and Clinical Research 10(10): 41-47.

25. Sharma P, Verma S, Misri P (2016) Global Need for Novel Herbal Drug Formulation. International Journal of Pharmacognosy and Phytochemical Research 8(9): 1535-1544.

26. Bozzuto G, Molinari A (2015) Liposome as Nanomedical Devices. International Journal of Nanomedicine 10(1): 975-999.

27. Singh MR, Nag MK, Patel S, Daharwal JS, Singh D (2013) Novel Approaches for Dermal and Transdermal Delivery of Herbal Drug. Research Journal of Pharmacognosy and Phytochemistry 5(6): 271-279.

28. Thakur L, Ghodasra U, Patil N, Dabhi M (2011) Novel Approaches for Stability Improvement in Natural Remedies. Pharmacogn Rev 5(9): 48-54.

29. Chanchal D (2008) Novel approaches in herbal cosmetics. Journal of cosmetic dermatology 7(2): 89-95.

30. Gupta A, Ashawat MS, Saraf S, Saraf S (2007) Phytosomes: A Novel Approach Towards Functional Cosmetics. Journal of Plant Sciences 2(6): 644-649.

DOI: 10.19080/JOJDC.2021.04.555631

How to cite this article: Sneha B, Deepika J, Bhavana S, Nidhi S. A Review on Novel Pharmaceutical Approaches of Herbal Drugs in Derma Care. JOJ Dermatol & Cosmet. 2021; 4(2): 555631. DOI: 10.19080/JOJDC.2021.04.555631