



# A REVIEW OF NEW PHARMACEUTICAL STRATEGIES FOR HERBAL MEDICINES IN DERMATOLOGY

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## ABSTRACT:

Herbal medicines are being used more and more around the world because they are more effective and have less side effects than allopathic medicines. Delivery of herbal drugs in new formulations is hard because it is hard to identify, process, standardise, and extract herbal drugs in order to get a controlled and steady release. Now that technology is getting better, nanoformulations are paving the way for innovative herbal medicine delivery systems that are more effective, bioavailable, and toxic-free. Many different types of new carriers, like nanoparticles, phytosomes, liposomes, microemulsion, etc., have been used to successfully change the way herbal medicines are delivered. Nanoformulation has many advantages over traditional methods of drug delivery, such as better absorption, solubility, and fewer side effects. The goal of this review is to give an overview of herbal medicines used in the India region, with a focus on the new ways that safety and effectiveness of these herbs have been improved and the types of active ingredients that have been utilised to create nanoformulations of herbal medications for topical skin care in order to improve therapeutic response.

**KEYWORDS:** Herbal Medicine, Herbal drug, Phytosomes, Liposomes, Dermatology, Skin

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## INTRODUCTION

Herbal medicines are made from plants and substances that come from plants. Herbal formulation is a dosage form made up of one or more processed botanicals or plants that is meant to have special nutritional, cosmetic, and other health advantages for the diagnosis and treatment of illnesses as well as change the structure or physiology of the body [1]. Herbal medicine is a sign that medicine and drugs are getting better and more modern [2]. Herbal medicines are made by using methods like extraction, expression, distillation, fractionation, and cleansing on whole plants,

parts of plants, or scraps of plants. Herbal medicine has become a safe way to treat illness as we have become better at analysing and controlling its quality. It is good for your health because it is pure and safe. Most people in the world use herbal products, most of them in poor countries [3]. There are many registered herbal industries in India, and there are also many herbal units that are not recognized [4]. More than 70% of Indians still use medicines that aren't made by doctors. Herbal medicines are a lot cheaper than prescription drugs. The cost of prescription drugs goes up a lot because



of research, testing, and marketing. Herbs can be bought without a doctor's note [5].

At home, you can grow simple herbs like peppermint, Ocimum, ginger, turmeric, cilantro, etc. Herbal medicines are becoming very famous because they are natural and safe [6].

**Advantages:** They cost less than medicines made by doctors. They can help with more than one thing. They don't hurt people as much. You can use them in many different ways. They don't need to be tested [7].

**Downside:** The effects may be hard to predict. Not enough rules. Results take longer to show. If you take medicine, some of them can make you feel bad. Some leaves might make you feel bad [8].

**Traditional methods:**

Traditional methods are used to give the plant medicine to the patient, which makes the medicine less effective. Because there was a lack of sufficient scientific evidence to support herbal medicines for a long time and because it was difficult to manufacture herbal medicines, such as standardizing, extracting, and identifying the specific medicinal components in complicated polyherbal systems, herbal medicines were not considered new goods for a long time. Modern herbal medicine research can help develop novel drug delivery systems by determining the appropriate route of administration, the site of action, the mechanism of action, the lethal dose, the therapeutic dose, and the pharmacokinetic

characteristics. Solid lipid nanoparticles, microspheres, micro-emulsions, dermal and transdermal patches, solid dispersions, liposomes, phytosomes, and microemulsions are some of these cutting-edge drug delivery techniques [10, 11].

Herbal medicines come from plants. Since ancient times, people have used plants and their parts to make herbal medicines. Nearly every part of the plant is used, including the leaves, stem, bark, seeds, and roots. Table 1 lists some of the herbs that come from plants, where they come from, and what they can be used for. In the India region, mostly in Haridwar and Kotdwar, there are a number of Herbal production plants that make herbal and Ayurvedic products. Herbal medicines are sold in many general shops in India. The government also helps the company that makes Ayurvedic medicines to grow and spread their business [12-14].

**How plant medicines are used:**

**Nutraceuticals:**

Nutraceuticals are food-based substances that can be taken by mouth and are thought to have a health or medical effect. Some examples are calcium, lycopene, choline etc. Scientists and researchers today are paying a lot of attention to finding out how foods help keep diseases away. **Table 1** is a list of information. Most of the herbs that have been used for thousands of years have been shown to help keep people healthy and treat illness [15-17].

**Table 1:** List of herbs with medicinal uses

Herbs	Biological source	Medicinal uses
Liquorice	Glycyrrhiza glabra Linn's dried roots, rhizomes, or stolons, which can be removed or not, are used to make liquorice. (The Leguminos Family)	Antiulcer, Anti-inflammatory, Addison's disease, preparation of cough lozenges etc
Turmeric	Get from the dried roots of Curcuma longa Linn. (Zingiberaceae Family)	Blood purifier, Menstrual pains, Aromatic, anti-inflammatory, liver disease, tonic etc
Ginger	It is made from the roots of Zingiber officinalis (Zingiberaceae family).	stimulant, Morning sickness, nausea, throat infection, vomiting, etc
Garlic	It is made from the fresh bulb of the Allium sativum Linn. (Lillyaceae) plant.	antigout Anti-inflammatory, antibacterial, nervine tonic, etc.
Senna	It is made of the dried leaves of Cassia angustifolia	Weight loss, Purgative, etc.



Vahl, which is in the Leguminosae family.
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### How to treat skin diseases:

Skin disease is a common illness that can affect people of all ages and hurt them in many ways. There are a lot of different skin diseases, but most of them can be put into one of the following categories [18].

**Rash:** A rash is a change in the skin or a group of spots that look different. The skin may become itchy, heated, chapped, dry, cracked, or burnt; swell; or pain from rashes [19].

**Viral Infection:** This is what happens when a virus gets into the skin and makes it sick. Some examples of viral infections are chickenpox, shingles, and warts [20].

**Bacterial infections:** There are many kinds of bacteria that can cause these illnesses, but staphylococci and streptococci are the most common. Bacteria can get into the follicles, the top layers of skin, or the lower layers of skin. If these infections aren't handled right, they could spread to other parts of the body. Impel folliculitis, cellulitis, and lime disease are all examples. Antibiotics are the best way to treat bacterial illnesses [21].

**Fungus infections** happen when fungi get into the skin. This illness can spread to the hair, nails, and skin. Tinea capitis, tinea pedis, tinea corporis, etc., are all examples [22].

**Parasitic infections:** These infections happen when parasites like lice and scabies get into the body [23].

**Pigmentation disorder:** This problem happens when the skin isn't the same colour all over. This is because of melanin. When our bodies make too much or too little melanin, dark or light spots show up on our skin. This is called pigmentation [24].

**Cancer:** are growths that happen when skin cells start to divide more quickly than they should. Not every growth on the skin is cancer. Some tumours are not dangerous and won't grow. Most people who get cancer get skin cancer. Early discovery makes it more likely that

the disease can be treated. So, self-examinations should be done regularly [25].

**Skin trauma** is damage to the skin caused by pulling, tearing, cutting, scraping, burning, etc.

**Miscellaneous:** There are also many other face problems, like wrinkles, scabies, psoriasis, warts, and so on [26].

### Some herbs can be used to treat skin diseases:

Herbal remedies are an effective technique to treat a wide variety of illnesses, particularly those that are difficult to recover from using conventional treatments. Herbal cosmetics are preferable to chemically-based cosmetics since they are derived from natural materials rather than chemicals. Because herbal products don't contain any man-made chemicals that could be irritating to the skin, they have garnered a lot of interest ever since they were first introduced. Antioxidants, vitamins, essential oils, tannins, alkaloids, colours, carbohydrates, and terpenoids are all examples of bioactive compounds that can be derived from plants. These ingredients are utilised in cosmetics to take care of the face, body, and other regions of the body. Researchers have investigated a variety of plants for their potential use as therapies for a variety of skin disorders, ranging from itchiness to skin cancer [27].

**Alovera:** It helps treat acne, inflammatory skin conditions, and small cuts.

**Neem:** Acne, warts, ringworms, eczema, and psoriasis can all be treated with neem.

It's great for skin health and problems, says Bhringraj. It keeps skin from getting wrinkled and dull. It also helps lessen the symptoms of acne, psoriasis, and dermatitis because it calms inflammation.

**Sandalwood:** It helps scars heal and fade. It slows down the ageing process. It also keeps acne and fine lines from showing up early.

**Beets** have anti-aging qualities that keep them from showing signs of age and fight pimples and acne.



**Marigold flowers** are often used to treat skin cuts, rashes, infections, warts, pimples, wrinkles, and other problems.

**Ganja:** The leaf powder can be used to treat cuts and sores. Ganja is put on the skin to relieve pain from diseases that make the skin itch. It helps with skin diseases like eczema, psoriasis, and acne, and it keeps you from getting viruses, bacteria, and fungi.

**Green Tea:** They bring old skin cells back to life, which makes skin look younger. It also stops the growing of skin tumours in the body from getting worse.

**Carrots** help stop fine lines and wrinkles and slow down the ageing process of the skin.

**Tomato:** It can help with face problems like uneven skin tone and signs of ageing. It might make burns less painful and help get rid of dead skin [28-29].

#### **Cosmeceuticals:**

The term "cosmeceuticals" refers to the newest products to enter the health industry. Cosmeceuticals are a relatively new category of skin care products with the dual purpose of enhancing both the skin's health and its appearance. Creams that prevent the appearance of wrinkles, for instance, would fall within this category [30].

**a. Products for the skin:** plant skin cosmetics are made with different plant active ingredients that are then added to a cosmetic base to heal and nourish the skin. Herbal cream, face wash, lip balm, herbal conditioners, herbal soap, and herbal shampoo are some of the herbal products that people use every day. Herbal ingredients in cosmetics have good effects on the body, like making the skin look smoother, healing, improving, and conditioning.

**Herbal cream:** Plant products are the most important part of herbal creams. Herbal creams come in the following types:-

**Vanishing cream:** When applied to the skin, vanishing creams, also known as oil-in-water emulsions (o/w), are nearly undetectable. Vanishing creams are a type of vanishing cream. They both keep the skin wet and make it soft. Jojoba fading cream is an example [31].

**Nourishing cream:** These creams don't leave skin oily, and they protect and feed skin at the same time. Himalayan replenishing cream is an example.

**Night cream:** You use these creams at night. They have nutrients that are good for the face and ingredients that make it feel better. Night cream keeps the skin from drying out and keeps it wet. Himalayan night cream that wakes you up.

**Moisturiser cream:** This type of cream is put on dry skin and helps heal and fix it. It also keeps the skin soft. Example – aloe moisturising cream.

**Acne cream:** These creams are applied to the surface of the skin, and they function primarily on the hair shafts and sebaceous glands in the affected areas. One such product is the Himalayan anti-acne and zits cream.

**Sunscreen:** This is put on the face to protect it from the sun's harmful rays. Ayur sunscreen is one of these plant sunscreens [32].

**Anti-wrinkle cream:** This type of cream is used to prevent the appearance of wrinkles and get rid of fine lines. Cream against wrinkles by Divya Tejas, for instance.

**Fairness cream:** These creams stop the production of melanin and lighten the skin. Himalayan beauty cream is a good example.

**Herbal powders:** In addition to baby powder, various types of powders such as cleaning powder, talcum powder, body powder, after-bath powder, and after-shave powder are also available for purchase on the market. There is a small change between the powders. So, in some ways, these powders are pretty much the same [33].

**Herbal face washes** are used to get rid of dirt, dust, and other things that have stuck to the skin on the face. One example of this would be the Aroma Magic Neem and Tea Tree Face Wash.

These combinations are applied to the face in the form of herbal face packs in order to improve the circulation of blood to the face, tone the facial muscles, make the skin on the face supple and flexible, and clear clogged skin pores by removing debris. Consider the

Himalayan neem face pack as an illustration of this [34].

**Herbal lip balms** are used to keep lips from cracking, chapping, and drying out. Lip balm is made with chemicals that can be eaten. They also have ingredients that block UV rays naturally and Vitamin E to feed and soften the skin [35].

To clean the body, herbal soaps are typically utilised. Fatty acids and the alkali metals that hold them together are the primary components of most soaps. Triglycerides like lard, coconut oil, and palm oil are the main types of fatty acids used to make soap [36].

**b. Herbal hair products:** These are used to style and strengthen hair, as well as make it look better. Most of the time, this mix is used to make hair grow faster and keep it healthy. Some hair goods are hair oil, shampoos, conditioners, colourants, and so on.

**Herbal tooth preparations** are used to treat and avoid tooth problems. These include herbal toothpastes, herbal mouthwash, herbal dentifrice, etc [37].

#### **Nutracosmetics:**

**Nutracosmetics** are a new category of health and beauty goods that improve both the way a cosmetic looks and how well it works. Herbs have many good benefits, such as acting as a sunscreen, slowing down ageing, keeping skin moist, fighting cellulite, and killing germs. Compared to cosmetics made from chemicals, herbal goods are gentle, biodegradable, and have a low level of toxicity [38].

Traditional medicines, like pills, creams, and so on, aren't very good at being absorbed through the skin. The average makeup doesn't work as well as cosmeceuticals. Herbal medicines have been used to treat illnesses since ancient times because they can work and have few side effects. Researchers have trouble with identifying, processing, standardising, and extracting plant drugs, which makes it hard for them to come up with new ways to use herbs. Traditional ways of giving plants to people show that they are less effective and have a low affinity for being absorbed through the skin.

Scientists have developed new drug delivery systems (NDDS) such as phytosomes, ethosomes, transfersomes, plant transdermal patches, nanoparticles, and biphasic emulsions to mitigate the severity of these problems [39]. A new way of delivering herbal drugs will improve their usefulness, efficiency, safety, and effectiveness, and it will also make the bioactive agents more stable. Plant actives and extracts work better and are more likely to be taken by the patient when these methods are used. Recent improvements in nanotechnology show that medicines that are hard to dissolve, hard to absorb, or have unstable herbal extracts or photochemicals may have a better chance of working. Research is being done to find new ways to make cosmetics look better and work better. In this way, different methods like liposomes, phytosomes, transfersomes, nanoemulsions, nanoparticles, microemulsions, etc. are studied [40].

There are benefits to making herbal medicines with new drug delivery methods, such as better drug targeting, high effectiveness, and better stability. Lessen bad effects and poisonousness, Better goods in terms of how they look, Long-term security by stopping the breakdown of plant actives, Lessen the chance that a plant will cause an allergy, Better dissolvability and absorption, Controlled drug delivery [41].

#### **Liposome:**

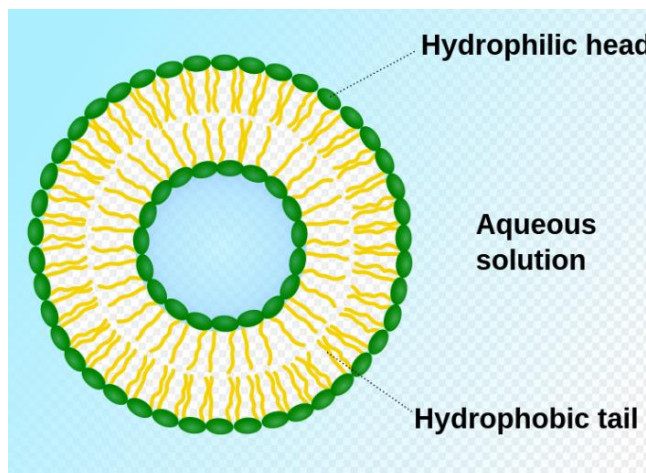
Liposomes are vesicles that have the shape of a sphere and contain an aqueous volume that is entirely encircled by a lipid bilayer membrane. This membrane is predominantly composed of phospholipids that are either naturally occurring or synthetically produced [42]. Liposomes are very common because they can carry both water-soluble and fat-soluble components, the system is flexible, and they can be used for a wide range of things. (Figure 1)

#### **The types of liposomes:**

The capability of ultra-deformable liposomes to contain active molecules and transport them into the epidermis by way of the outer carrier layer. This made these skin care items work

better and be easier to use. Offer a way to free time. In skin care products, they are used as a

way to send the active ingredients to the deeper layers of the epidermis [43].

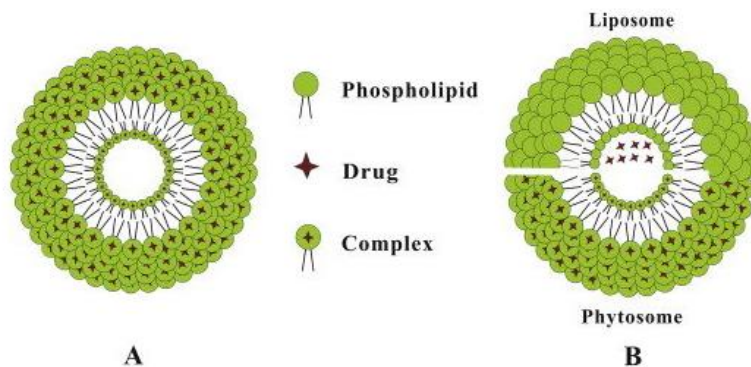


**Figure 1:** Structure of Liposome

#### **Phytosomes:**

The prefix "phyto" refers to plants, and "some" can be interpreted as either a roof or a structure. The tiny structures known as phytosomes have the appearance of cells. When making phytosomes, it is common practise to combine one or two moles of polyphenolic phytoconstituents with one or two moles of phospholipid. It could be a 1 to 1 matchup or a 1 to 2 matchup. When employing phytosomes, one can enhance the amount of lipophilic herbal components that pass through lipid membranes while simultaneously increasing the speed at which this process occurs [44]. This is due to the fact that phytosomes are a carrier, and this allows acid-sensitive herbal medications to be protected while they are being transported through the digestive system. It is a new method that has been patented for combining water-soluble

phytoconstituents or standardised plant extracts with phospholipids to produce molecular complexes that are compatible with lipids. This method was developed in the United Kingdom. The vast majority of the active components of phytomedicine, such as flavonoids, glycosides, and other such substances, are soluble in water. [45] Flavonoids are a large class of bioactive compounds that have a wide variety of applications in the field of medicine. In addition to their medical use, the majority of flavonoids found in plants, such as glycyrrhizic acid and silymarin, are also useful in the cosmetics industry. Flavonoids extracted from plants have been shown to be effective local treatments for a number of disorders, including inflammation, swelling, discomfort, and fungal infections (Figure 2) [46].



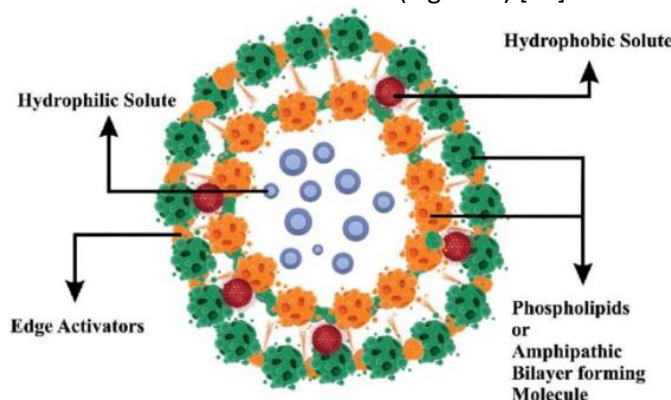
**Figure 2:** Structure of Phytosome

**Benefits of Phytosomes:** They make skin care products more bioavailable. The skin care product with phytosomes is also better than the one with liposomes. They can also be used to help products get through the skin better for dermal release [47].

**Transferosomes:** Transferosomes are vesicles that look like sacs and are made of phospholipids. They could be used to transfer

drugs through the skin. It gets around the problem of getting through the stratum corneum. Because they are flexible, it is easy for them to get into the skin through the internal pores. Colchicine delivered through transferosomes gets to the right place and stays there for a long time. It also doesn't have the side effects that come from taking it by mouth (Figure 3) [48].

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**Figure 3:** Structure of Transferosomes

The Conclusions of Recent Studies Concerning the Function of Herbs in Cosmetics and Skincare Rane RB et al discussed It is possible for herbal medicines to be utilised for healing, and there are numerous ways to administer these medications, some of which are more effective than others. When working with bioactive compounds and plant extracts, a number of novel aspects of nature are considered, including polymeric nanoparticles, liposomes, phytosomes, nanoemulsions, microspheres, transfersomes, and ethosomes [49]. Kumar Sudhir et al discussed Even though their clinical

validity is questioned due to their tools, such as low lipid solubility, poor solubility, high size moiety, and needless metabolism in the gut, phytochemicals have been curing the planet for millions and billions of years. This is despite the fact that their tools contain tools such as these. Phytosome technology has become a serious and hopeful way to target new drug delivery methods that improve the effectiveness, quality, and ability to reach their intended targets of active plant constituents. Researchers are sure that the secondary metabolites from plants will get to their systemic targets because

they have found new ways to mix herbs. Riya Arora et al. looked at the safety of herbal cosmetics and how they relate to chemical cosmetics. Herbal ingredients in cosmetics have good effects on the body, like making the skin look smoother, healing, improving, and conditioning. Pal Saxena, Rashmi, and others talked about how natural ingredients could be used to make new skin anti-aging cosmeceuticals. Such products have anti-inflammatory and anti-stress properties as well as anti-oxidant properties that protect cells and help keep skin healthy. Afrin S. et al. talked about different ways to give herbal drugs, including herbal transdermal patches, phytosomes, nanoparticles, ethosomes, transfersomes, and biphasic emulsions. A new way of giving herbal drugs to people will make them work better and be safer, and the drug result will be more stable. Plant actives and extracts work better and are more likely to be taken by the patient when these methods are used. Yapar EA talked about herbal cosmetics [50]. According to him, the most important variables that specifications of the herbal inputs, the formulation's structure, and the manufacturing procedure are what determine the final quality and stability of herbal cosmetics.. He said these three things are the most crucial. In their study, Kumar Arun and colleagues discussed how the low oral bioavailability of polyphenolic compounds could be enhanced by encasing them in a self-assembled transport system consisting of phospholipids. This would allow the compounds to be more readily absorbed by the body. A phytosome is the name given to this particular mechanism. Phytosomal drug delivery systems can be found in a variety of products, including Ginkgo biloba, Silybum marianum, and Camellia sinensis, which are all now available on the market. Sharma Parth et al. discussed current breakthroughs in the use of plants as medicines. Some examples of these developments include the invention of novel herbal products such as polymeric nanoparticles, nanocapsules, liposomes, phytosomes, nanoemulsions, microspheres, transfersomes, and ethosomes,

etc. Nanoformulations have better selectivity, drug delivery, and efficiency with a smaller dose, which not only makes them safer but also makes patients more likely to take them as prescribed [51]. Bozzuto Giusepinna and Molinari Agnese looked at how well liposomes work based on their size, surface charge, and the way their lipids are organised. Also talked about how the physical and chemical features of liposomes affect how they interact regarding cells, their half-life, their capacity to enter tissues, and the location in the body where they ultimately find themselves. Singh Rawat Manju, et al. discussed recent technological advancements for the development of new drug delivery systems. These advancements are geared towards the creation of organic drug delivery systems that have improved bioavailability, increased therapeutic effect, and decreased toxicity. Numerous novel transporters, such as nanoparticles, phytosomes, liposomes, transfersomes, etc., have been used to successfully modify the way that herbal pharmaceuticals, such as tacrolimus, quercetin, silybin, ginkgo, ginseng, Berberine, etc., are taken into the body. These new transporters have been used to successfully change the way that herbal drugs are taken into the body [52]. Thakur L. et al. talked about the problems with traditional plant medicines and the need to come up with new ways to use herbs. Chanchal D et al. looked into and talked about different ways to transport nutraceuticals, such as liposomes, transfersomes, phytosomes, nanoemulsions, nanocrystals, nanoparticles, cubosomes and microemulsions. Gupta Amit et al. talked about phytosomes, which are new structures that are made up of bioactive parts of plants that are surrounded by lipids. Phytosomes are possibly a way to make it easier for phytoconstituents to be absorbed through the skin, which can help control how the skin works [53].

#### **CONCLUSION**

India is where herbs grow, and it is also where Ayurveda began. In this review, we have made a list of all the popular herbs in India. Herbal drugs have many beneficial uses that should be





looked into with the help of new drug delivery technology. This study tells you how new ways to give drugs in plant medicine are improving, why they are needed, and what they can be used for. Herbal drugs can heal in many ways. So, using new drug delivery methods on phytoconstituents can improve their bioavailability, solubility, and permeability. This can lead to a lower dose and fewer side effects. When plant parts are put into new drug delivery methods instead of standard extracts, they work better at the same dose or less. So, coming up with new ways to give plant drugs holds a lot of promise and could be very helpful.

**DECLARATIONS:**

**Ethics approval and consent to participate:**

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All the authors approved the manuscript for publication.

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**Competing interests:**

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