



NOVEL HERBAL DRUG DELIVERY SYSTEM

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ABSTRACT-

The kind of novel herbal formulations such as liposomes, phytosomes, microspheres, and ethosomes has been reported using proactive and plant selections. The novel formulations are described to have remarkable Phytosome is a patent technology developed by a leading maker of drugs and nutraceuticals, to incorporate standardized plant extracts or water soluble phytoconstituents into phospholipids to produce lipid compatible molecular complexes. Phytosome is a patented technology developed by a leading maker of drugs and nutraceuticals, to incorporate standardized plant extracts or water soluble phytoconstituents into phospholipids to produce lipid compatible molecular complexes. The herbal drugs can be used in a more upright course with enhanced efficacy by incorporating them into modern dosage forms.

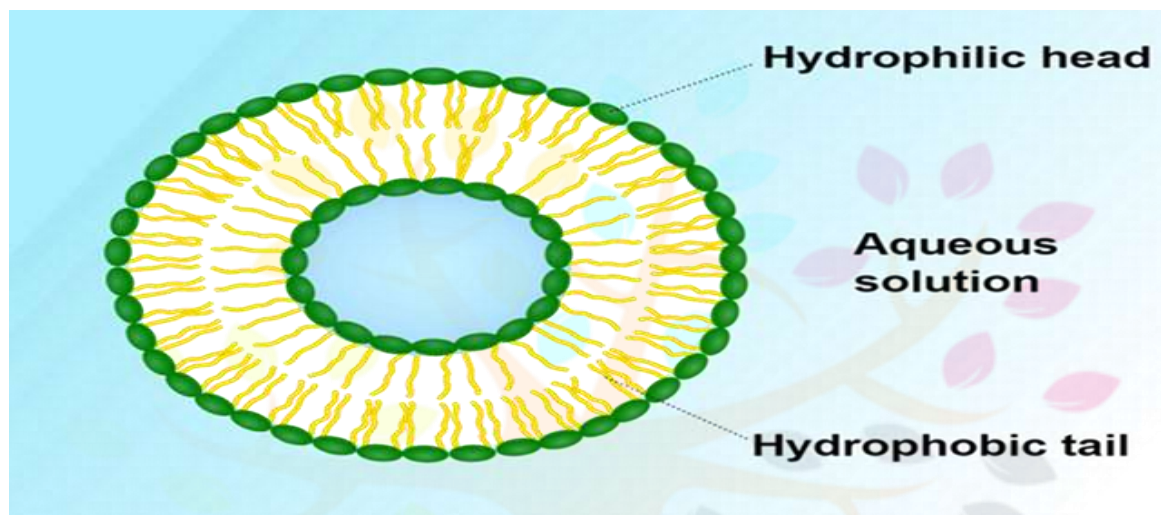
Key Words- Liposomes, Phytosomes, Niosomes, Ethosomes.

INTRODUCTION-

The need for NDDS in herbal medicines The term "novel drug delivery system" (NDDS) refers to methods, formulations, technologies, and systems for safely delivering pharmaceutical compounds to their intended therapeutic effects within the body. If the cutting-edge medication delivery technology is used in herbal medicine, it could improve the effectiveness and lessen the negative effects of different herbs and herbal compounds. This is the fundamental rationale behind the use of innovative medication delivery systems in herbal medicines. By delivering the treatment only to the area of the patient's body that is afflicted, novel herbal drug carriers treat specific diseases. NDDS is useful in that it releases the herbal medication at a predetermined rate and delivers the medication directly to the area of action, minimising adverse effects increasing bioavailability. In innovative drug delivery technology, the drug is incorporated into a carrier system or the molecular structure of the drug is changed to govern the drug's social organisation. Herbal medicines added to the delivery system also help with solubility, stability, toxicity protection, pharmacological action, tissue macrophage distribution, prolonged delivery, and protection from chemical and physical deterioration. By raising the amount of drug in the tumour location while reducing the exposure or accumulation of drug in normal cells/tissues, liposomes, for instance, operate as potential carriers to take anticancer drugs, limiting tissue toxicity effects. The medications are produced in an appropriate formulation that takes into account the safety, acceptability, and efficacy of other substances. This preparation is frequently referred to as a dosage form or drug delivery system. The dosage forms have evolved from straightforward mixtures and pills to extremely complex technologies, intensive drug delivery systems, or NDDSs, as a result of advancements in all fields of science and engineering. As opposed to traditional distribution of herbal infusions, direct binding of phosphatidylcholine to herbal extract components resulted in superior absorption properties.

LIPOSOMES-

These are microscopic particles or colloidal carriers that spontaneously develop when specific lipids are hydrated in aqueous conditions and range in size from 0.05 to 5.0 μ m. In the liposomes sphere-shaped particles that contain a portion of the solvent in which they freely circulate float inside of them. Both hydrophilic and lipophilic molecules can be contained by liposomes. Liposomes, which are often made of phospholipids, have been utilised to alter the pharmacokinetic profile of various substances, including medicines, vitamins, enzymes, and even herbs. By boosting chemical solubility, increasing ingredient bioavailability, enhancing intracellular absorption, altering pharmacokinetics and biodistribution, and improving in vitro and in vivo stability, liposomes can improve the performance of products. By delivering medications to their sites of action and sustaining therapeutic drug levels for extended periods of time, liposomes as a drug delivery technology can enhance the therapeutic activity and safety of drugs.



[1]

Fig. Liposome

PHYTOSOMES-

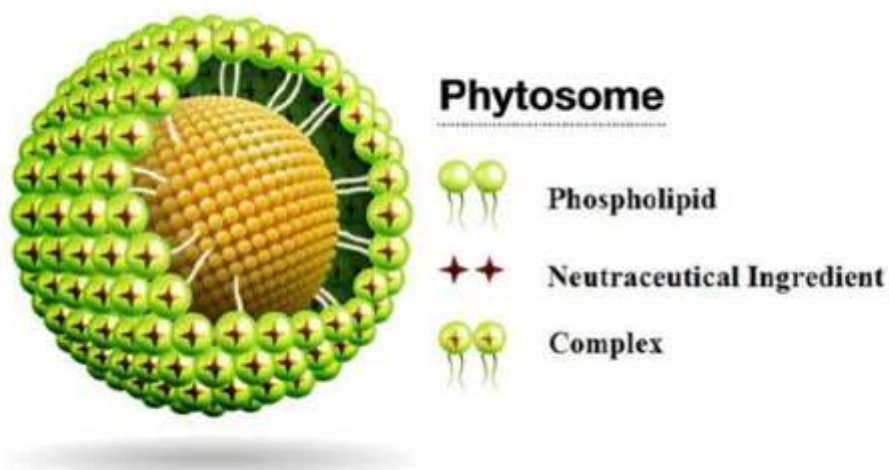
The majority of phytomedicines' bioactive components are flavonoids, which have a low oral bioavailability. Phytosomes are lipid-compatible molecular aggregates that can be formed from water-soluble phytoconstituent molecules, primarily polyphenols.

Phytosomal complexes were initially researched for cosmetic uses, but over the past few years, there has been a growing body of evidence indicating their potential for drug delivery, with positive effects on the cardiovascular, anti-inflammatory, hepatoprotective, and anticancer fields. Phytosome complexes outperform their noncomplexed herbal extract in terms of pharmacokinetics and therapeutic characteristics. The bioavailability of a few phytochemicals has been significantly improved via phytosome technology.

Numerous plant products' chemical and biological makeups, biological functions, and health-promoting qualities have been established during the past century by phytochemical and phytopharmacological studies. The majority of a plant's biologically active components are polar or water soluble compounds. Water-soluble phytoconstituents, such as flavonoids, tannins, and terpenoids, are poorly absorbed either because of their large molecular size, which prevents passive absorption, or because of their poor lipid solubility, which severely restricts their ability to cross lipid-rich biological membranes and leads to poor bioavailability restricts their clinical utility frequently.

Phytosomal complexes were initially studied for cosmetic purposes, but over the past several years, a growing body of research has shown that they have the ability to carry drugs, with positive effects on the heart, inflammation, the liver, and the prevention of cancer. Phytosome complexes outperform their noncomplexed

herbal extract in terms of pharmacokinetics and therapeutic characteristics. The bioavailability of specific phytochemicals has been significantly improved using the phytosome technique.



[2]

Fig. Phytosome

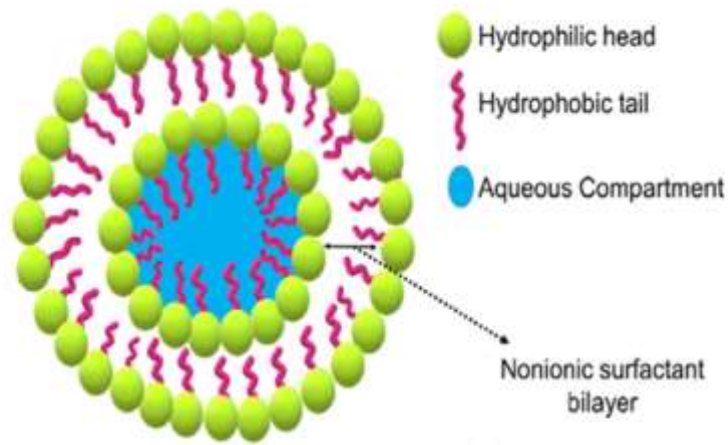
NIOSOMES-

Niosomes are vesicles made of cholesterol and non-ionic alkyl or di-alkyl polyglycerol ether surfactants. Similar to liposomes, niosomes may serve as medication delivery systems. In that they provide some advantages over liposomes, niosomes are distinct from liposomes. In that they provide some advantages over liposomes, niosomes are distinct from liposomes. Phospholipids, one of the constituents in liposomes, are chemically fragile because to their propensity for oxidative destruction, they require specific care and memory, and the purity of natural phospholipids varies. Niosomes are not affected by any of these issues. Niosomes are multilamellar vesicles made of cholesterol and non-ionic surfactants from the class of alkyl or dialkyl polyglycerol ethers.

As a result of their propensity for oxidative stress, phospholipids, one of the constituents of liposomes, are chemically unstable. The purity of natural phospholipids varies, they need specific care and memory, and they are subject to decay. Niosomes are not affected by any of these issues. Large unilamellar vesicles (LUV, size=0.10 μ m), multilamellar vesicles (MLV, size=0.05 μ m), and small unilamellar vesicles (SUV, size=0.025-0.05 μ m) are the three types.

Niosomes were created as chemical drug delivery systems for the treatment of a variety of illnesses, including cancer, diabetes, inflammation, and others. This formulation is one way that niosomes are used to deliver chemical medicines and increase oral bioavailability.

Research Through Innovation



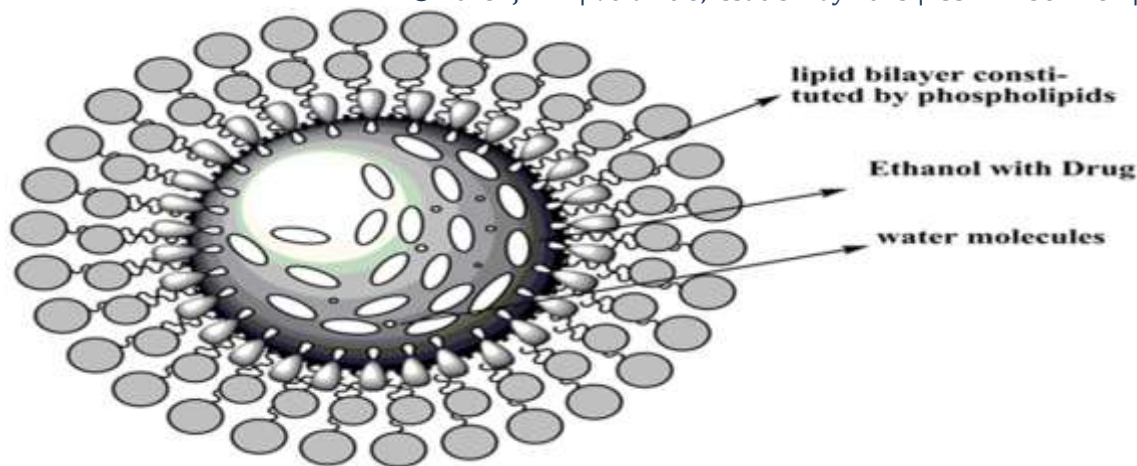
[3]

Fig. Niosome

ETHOSOMES-

The creation of ethosomal patch, which contains medication in ethosomes, is the result of more recent breakthroughs in patch technology. Water, ethanol, and soy phosphatidylcholine make up ethosomal systems. They have a high entrapment capacity for particles with different lipophilicities and can create multilamellar vesicles. In addition, a variety of small compounds, peptides, proteins, and vaccines have been administered via the elastic vesicles and transfersomes as drug carriers. The skin can be entirely penetrated by ethosomes, which enhance medication delivery via the skin due to their high deformability and trapping effectiveness. Similar to other liposomes, ethosomes' physical and chemical characteristics enable efficient drug delivery through the stratum corneum into a deeper skin layer or even into the bloodstream.

In a pilot clinical trial, 40 acne patients received ethosomal gel containing clindamycin phosphate and salicylic acid for eight weeks, twice a day, using the gel. As compared to placebo, volunteers receiving ethosomal gel had a significant improvement in their acne condition, with fewer comedones, pustules, and overall lesions. In a pilot clinical investigation, ethosomal prostaglandin E1 preparation was assessed in individuals with erectile dysfunction. It was found that the peak systolic velocity and penile rigidity of 12 out of 15 individuals who underwent testing had improved. The erection lasted 10 to 60 minutes. In all of the aforementioned clinical trials, there were no documented cutaneous side effects related to the therapy.



[4]

Fig . Ethosome

APPLICATION-

DIABETES-

In recent decades, diabetes mellitus has become a global epidemic and has been listed as the fifth leading cause of death in the majority of industrialized nations.

Diabetes mellitus is a chronic hyperglycemic illness that is characterized by incorrect glucose, lipid, and protein metabolism. Diabetes mellitus has numerous etiologies.

CARDIOVASCULAR DISEASE-

Heart and blood vessel involvement occurs in the class of diseases known as cardiovascular disease. Heart muscle disease, heart failure, and coronary artery disease all fall under the category of cardiovascular disease. Heart rate right away.

Cardio, Blood Pressure Companion, Blood Pressure Monitor, Pulse Point Respond, and Cardiac Diagnosis.

CONCLUSION-

This article provides a summary of Novel. Since ancient times, herbal remedies have been used extensively around the world. Both physicians and patients recognize the superior therapeutic benefit of herbal remedies over modern ones since they have fewer side effects. NDSS aid to boost the therapeutic value by lowering toxicity and raising bioavailability, which reduces the need for repeated administration to combat noncompliance.

REFERENCE-

- Medina OP, Zhu Y, Kairemo K. Targeted liposomal drug delivery in cancer. *Curr Pharm Des* 2004;10:2981-9.
- Mandal SC, Mandal M. Current status and future prospects of new drug delivery system. *Pharm Times* 2010;42:13-6.
- Ajazuddin SS. Applications of novel drug delivery system for herbal formulations. *Fitoterapia* 2010;81:680-9.
- Goyal A, Kumar S, Nagpal M, Singh I, Arora S. Potential of novel drug delivery systems for herbal drugs. *Indian J Pharm Educ Res* 2011;45:225-35.