PHARMACEUTICAL AND COSMETIC IMPORTANCE OF ASCORBIC ACID AND B-SITOSTEROL

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Glycolipid is a specific organic material which consists of two parts: the sugar part is more soluble in polar solvents such as water and the other part is hydrophobic and prefers non-polar solvents such as organic solvents.

In this research we synthesized glycolipid having glucose as the polar part and β-sitosterol as the non-polar part of the glycolipid. Glucose is an abundant material in both plants and animals whereas, β-sitosterol is a cyclic alcohol found in green plants. β-sitosterol possesses several benefits for humans. It helps to minimize the prostate glands enlargements minimizing the potential of prostate cancer, stimulates the growth of hair and most importantly it reduces bad cholesterol level in the blood.

Liposomes and microemulsions were formulated incorporating the synthesized glycolipid where it functions as a building material for the liposome and as a co-surfactant for the microemulsion. Liposomes and microemulsions are known to show remarkable efficiency in the drug delivery in human body.

Liposome is a globular shape structure; it may have at least one membrane or more. They are thermodynamically stable; therefore water soluble drug can be encapsulated in the cavity of the liposome or among the membranes.

Vitamin C (ascorbic acid) was selected as the model drug for both liposome and microemulsion. Ascorbic acid is an important drug because it cures scurvy, functions as a cofactor in enzymatic reactions in human body and stimulates the generation of collagen fibers helping to keep juvenility. It also plays a vital role in healing wounds and preventing oozing blood from capillaries. In this project, liposomes are prepared by Reverse Phase Evaporation Method in order to achieve higher encapsulation efficiency. The encapsulation efficiency of 63% was achieved for ascorbic acid.

However, a major problem concerning vitamin C is its high sensitivity to alkaline conditions and heat. During the storage of ascorbic acid it undergoes decomposition with time. Our Liposome and Microemulsion accomplish better answer for this problem wherein the encapsulation helps to keep the ascorbic acid in its stable active form for a longer period of time. The applications of the research are in the preservation of the activity of ascorbic acid in formulations such as cosmetic skin creams and also in fruit juice preparations. Liposomes and microemulsions can improve the delivery of the ascorbic acid through the skin over cream formulations in which ascorbic acid is in the free form.

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